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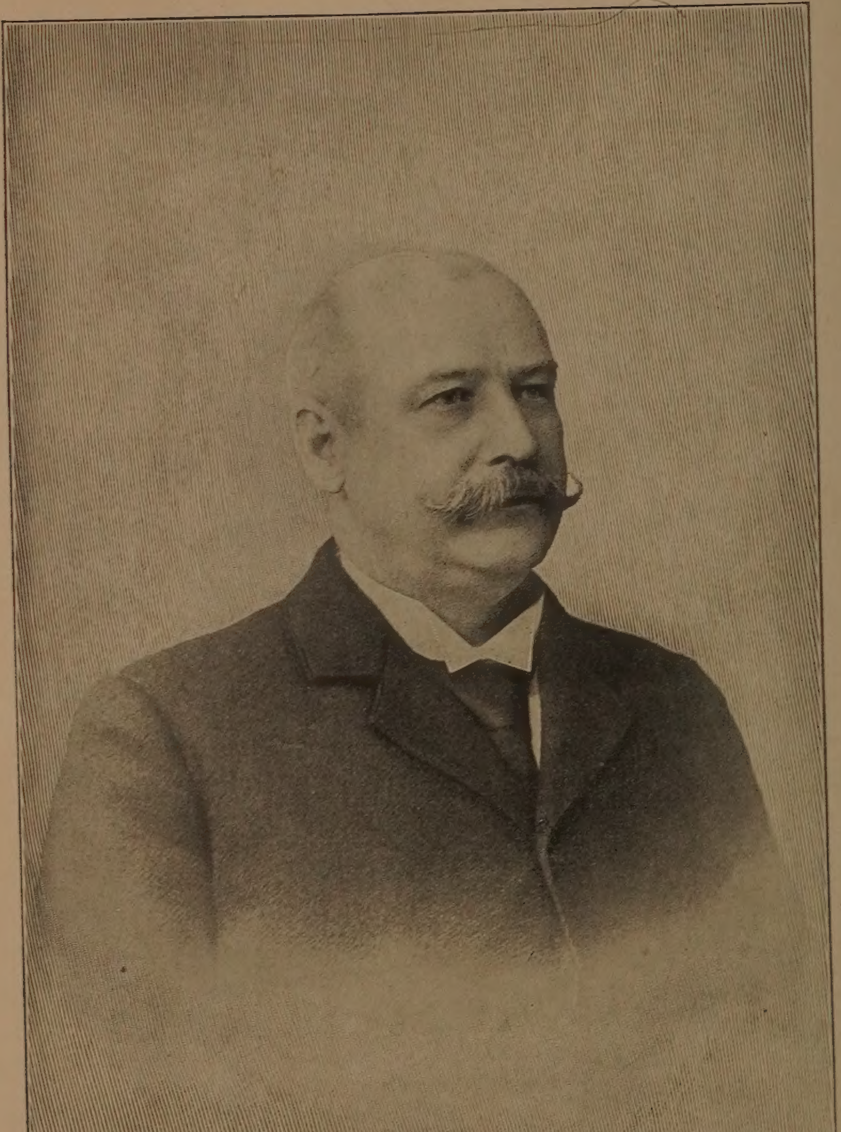

J. P. WOOD, M.D., A.M., L.B.

MEDICOLOGY

OR

Home Encyclopedia of Health.

A COMPLETE FAMILY GUIDE.

ABOUNDING IN

Practical Household Information on the Structure and Functions
of the Human Body, the Laws of Hygiene, Diet, Accidents
and Emergencies, Accessory Treatments and Remedies,
Air and Exercise, Sanitary House-Building, Duties
of Mothers, Care of Children, Art and Science
of Nursing and Cooking, Home Administration of Medicines.

TEN BOOKS—ONE VOLUME.

BY

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Professor of Hygiene in the University of Pennsylvania; Member of the Foreign Hygienic Society, Paris; Author of "Long Life and How to Reach It," etc., etc.

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WIDE THANKS TO THOSE THAT HAVE GONE BEFORE.

It may be said that during the past five years the treatment and cure of general diseases has entirely changed; that more important discoveries and new and successful methods for the curing of disease have been proven and adopted during this time than in any similar period during the past century. The treatment of five years ago that was considered the best has given way to a better one. The old method of treating fever by shutting the patient in a tight room, smothering him with bedclothing, allowing no ice water, and dosing with medicine, was often followed with fatal results. The modern treatment is entirely changed. It does not matter whether the fever is typhoid in its character, pneumonia, or malarial fever, the patient is now covered lightly with a sheet, the room perfectly ventilated and the temperature largely controlled by the application of water externally. Measles, that used to leave patients with weak eyes and all sorts f trouble, is now easily treated by simple methods. The treatment for scarlet fever, that formerly renderd the patient liable to being left deaf or crippled, is entirely changed and fatalities reduced one-half. So we might mention the entire list of general diseases. It is not too much to say that the fatalities of all diseases have diminished more than one-half by the new treatments and cures adopted within the last five years. But even with this almost entire change and improvement in the treatment and cure of diseases, there is much that is valuable in the Medical Libraries and "Family Physicians" that have been published heretofore. To the latest medical works of our great universities and colleges that our editors have gleaned from, also for the information and knowledge gained from the older Family Doctor Books, such as

El Medico del Hogar,
Hering's Domestic Physician,
Warren's Household Physician,
Greer's Physician in the Home,
Chavasses' "Manual for Wives and Mothers,"
Woods' Vitalogy,
American Family Physician,
Newell's Family Doctor,
Bilz's Natural Healing,
Kelley's Domestic Medical Practice,
Gunn's Revised Family Physician,
And many others,

we desire to express our acknowledgment and widest thanks.

THE PUBLISHERS.

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THE HUMAN BODY.

ITS MARVELOUS WONDERS.

A Description of the Colored Anatomical Charts Composing the Manikin Accompanying this Work.

CHART I.

A PICTURE OF GOOD HEALTH.

This exquisitely beautiful and artistic Anatomical Plate presents the head and face of a young man in the enjoyment of perfect health. Apart from the subject it so accurately and faithfully represents, it is in itself a valuable life-like portraiture of the human head and face, and shows to what perfection the art of anatomical plate printing has attained. Note the prominent perceptive faculties, the high forehead, features characteristic of a large brain and a massive and unimpaired intellect. Mark the open expression of the eye; how true to nature and life-like. Observe the compressed lips, denoting firmness of character and determination of purpose. Look attentively at the bright, open, manly countenance; there are no signs of mental decrepitude, physical bodily infirmities, nervous fear, or exhaustion of brain power or life-force in the expression of the noble, ruddy and healthy face. It is, as its name implies, typical of *Perfect Health!*

Muscles of the Face and Neck.—This fine plate is a remarkably realistic and accurate representation of the head and neck, after the outer skin has been removed. It shows the bare skull, together with the admirable and skilful arrangement of the muscles of the face and neck; also the external part of the ear. There are, also, numerous blood-vessels noticed meandering over the parts exposed to view, by means of which this muscular area receives its supply of nutrient blood. The large, broad muscle observed over the forehead is the one by which we elevate the brow, and in conjunction with the orbicular muscle that is seen surrounding the eye, we can contract the brow, as in "scowling."

Muscles of the Face.—The muscles of the face are those employed to give variety of expression to the countenance. It is through the medium of these small but useful muscles that public speakers can give facial emphasis to their flow of rhetorical eloquence; the tragedian employs them to give dramatic effect to the various characters he impersonates, and the low comedian and "clown" cultivate them for facial contortion and "guying" characterization. The numerous muscles observed about the neck are those which give elasticity and mobility to the head. It is by means of these muscles that the head can rotate on its axis, bend forward, backward, sidewise, and pose in the diversified attitudes and various positions it can be made to assume.

THE BRAIN; AND A VERTICAL SECTION OF THE FACE AND NECK.

What the Plate Shows.—As we progress in our anatomical course of study, our attention is firmly and deeply fixed in wonder and amazement at the marvelous mechanism revealed in the sublime profundity and grandeur brought out in this magnificent artistic plate. It brings before our astonished vision the beautiful proportions and symmetry of the human brain as it lays *in situ* within its bony castle; and as we look upon its wavy convolutions we naturally turn our thoughts to the hidden mysteries of mind and to its superiority over matter, and to the illimitable intellectual properties, powers and capacity of the mind, that lay quietly slumbering in the depths of the human brain, for the mind of man surpasseth all things of human conception or construction. Below this mighty throne of reason and intelligence, on the left, we observe the cerebellum or lesser brain, the fount from whence all the vegetative or organic functions of life—as respiration, beating of the heart, digestion, etc.—receive their inspiration and supply of vital force.

View of the Eye.—We can likewise view the human eye as it lays in position in its bony socket, and wonder at our Creator's munificence and benevolence in providing us with such a delicate instrument of vision with which to light our way about in the world, and view the magnificent beauties of nature that surround us on every hand. Here, too, we observe the teeth, those essential pre-requisites to personal beauty, and valuable adjuncts to the powers of articulation and speech, protruding through the gums; their roots being visible above and below the gums; and in the lower set we see the dental nerve distributing its nervous supply to their individual and collective roots.

The Neck Muscles.—This beautiful illustration brings out in bold relief the superficial and deep muscles of the neck, and, at the same time, we observe a faithful delineation, not only of the relative position of the

A PICTURE OF GOOD HEALTH

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CHART 1.

carotid artery and jugular vein, but also of the manner in which the muscular and fleshy part of the neck receives its nervous supply.

VIEW OF THE BASE OF THE CRANIUM.

Brain Cavity.—Here in this remarkable illustration we have presented to us one of the most wonderful views in the anatomy of the skull, or, in fact, of any part of the human frame. It is a view of the floor of the cranial cavity on which that curious and mysterious, but sublime organ, the brain, rests. The marvelous skill and ingenuity therein displayed, of the complex mechanism surveyed, the beautiful and intricate manner in which the nerves of special sense are so elaborately set forth, the complicated profusion and exquisite design manifest in the distribution of blood-vessels for the nourishment and support of the special organ of reason and intelligence—all claim our closest and undivided attention, and we are unconsciously led to revere the Omniscience of Him who could conceive of such intricate architecture, and perform such delicate, unique and perfect workmanship. The large opening observed in the floor of the cranial cavity is the *foramen magnum*, through which the spinal cord, together with the cerebro-spinal nerves, escape.

SECTIONAL VIEW OF THE BRAIN, FACE AND THROAT.

The Brain in its Bony Citadel.—The artist, with true anatomical instinct and a rare technical ability in regard to accuracy and minute detail, has performed his part of the work in this illustration with such faithful fidelity to nature that one cannot withhold a word of praise at the grand style and elaborate manner of its execution. This elegant and artistic anatomical plate represents the brain held firmly in position within its strong bony citadel, but cleft in twain from above downward, thus showing its internal mechanism and construction; besides which it gives the internal arrangements of the nose, tongue, throat and neck.

Order of Brain Mechanism.—Commencing from above and descending downward we observe the following important structures, to wit: The fascia or skin covering the cranial bones; and then a section of the bones themselves, showing their laminated structures. Between the bones of the skull and the brain are seen the meningeal coats of the brain, which serve the double purpose of supplying it with blood-vessels and protecting that delicate organ from pressure or injury.

Cerebrum and Cerebellum.—We observe that the cerebrum, the seat of mind and volition, is much larger than the cerebellum or little brain:

and as though that was not enough area for the evolution of the mind, we see this part of the brain most curiously wrinkled and folded into various sized convolutions, thus increasing the mental surface. The more numerous these convolutions are, the higher and more noble the mental faculties and intellectual powers become. The hemisphere of the brain, here shown, is seen to be divided into three lobes, the frontal, middle and posterior. The *Corpus Callosum*, or the great commissure of the brain, is most faithfully represented, and immediately below is seen the *Fornix*. The peculiar appearance of the cerebellum or little brain presents a tree-like resemblance, whence it is called the *arbor vitæ*, or the tree of life.

The Olfactory Nerve.—The olfactory nerve is graphically displayed, branches of which are seen passing in all directions over the mucous membrane of the nose. A little to the left of the olfactory nerve is seen the posterior nares, and immediately below the pharynx and epiglottis, the œsophagus or gullet, the larynx and trachea or wind-pipe.

The Tongue.—The tongue, or organ of taste and instrument of speech, is most accurately represented, the muscular fibres of which are seen running in different but determinate ways, thus giving to this important organ variety and regularity of motion and aiding it to assume numerous shapes and forms. The cervical portion of the spinal column is seen, with the fleshy part of the back of the neck attached. This plate is one that commends itself to our deep and careful study.

VIEW OF THE BASE OF THE BRAIN, AND THE THOUGHTS IT SUGGESTS.

Shape of Brain.—As so graphically delineated in this beautiful as well as natural illustration of the human brain, we glean a knowledge of the origin and source of its blood supply; the arteries are observed to distribute numerous branches in various directions along and over its surface, many of which penetrate its substance. As noticed, the brain presents an ovoid or egg-shaped appearance, divided into two equal, lateral halves—hemispheres as they are called—thus virtually giving us two brains, the same as we have two eyes, two arms and two legs. With this surplus of brains, as it were, at our command, we are naturally led to ask the question, who can define the metes and bounds of the mind?. Or describe the limits of our intellectual capacity? Who can fathom the depths of thought? Or circumscribe our mental, educational or scientifical acquirements, when health crowns the human temple with its rubicund mantle? Echo answers who!

Beauty of the Brain Views.—Every view of the human brain we have seen in this series of magnificent and unparalleled anatomical plates has inspired our admiration and held us spell-bound in utter astonishment and amazement at the limitless attributes, the diversified powers, and the variety of functions this wondrous and mysterious organ is called upon to perform in the hourly transactions and business pursuits of daily human life. And yet, notwithstanding the marvelous properties of this elaborate organ, it is the least solid and most unsubstantial looking body of the human casket.

Consistency of the Brain.—It consists of eighty per cent. of water, seven per cent. of albumen, some phosphorized fat and a few other minor substances. Such is the composition of the mighty and powerful organ which rules the world. Whilst the brain is the seat of sensation, yet it can be cut, burned or electrified without causing pain in itself. Strange, passing strange, are the properties and powers of the brain!

BONES OF THE HEAD, FACE AND NECK.

Bones of the Skull.—This illustration gives an accurate and faithful representation of the head, face and neck, surrounded by an outline of the fleshy parts as they appear in the human frame. The bones of the head, eight in number, constitute the skull, and those of the face, fourteen in number, compose a strong, hard, bony case, which encloses and affords a suitable protection for the brain and the four organs of special sense, *viz.:* sight, smell, taste and hearing. All of these bones are immovable, except the lower jaw, which moves by means of a hinge-joint, and permits of the opening and closing of the mouth.

Bones Seen in the Plate.—The bones of the skull observed in this beautiful plate are: the frontal, which forms the forehead or front part of the skull; the parietal, constituting a portion of the side and top of the head; the occipital, forming the lower and back part of the skull, and the temporal, which forms the lower part of the side and a part of the base of the cranium. These several bones are joined together by notched seams, after the manner carpenters call "dove-tailing."

Shape of the Skull.—The skull, as will be seen, is oval, which adapts it to the conformation of the brain, besides giving it greater resistance to pressure. The stronger and smaller end is in front, where danger is greatest to the brain, whilst the projections before and behind shield its less protected parts. The peculiar conformation and shape of the skull forms a strong shelter for the brain—an organ so delicate that if not so strongly guarded from injury, an ordinary blow falling upon it would destroy it forever.

Bones of the Face.—The bones of the face shown in this plate are the nasal bone, forming the arch of the nose, the malar, which gives prominence to the cheek, the upper jaw, containing the upper teeth, and the lower jaw, containing the under teeth.

The Spinal Column.—That portion of the spinal column noticed in the illustration consists of the cervical vertebræ. Each vertebra is composed of a body, with seven spinous processes projecting from it. The body is perforated by a ring, through which is seen running the spinal cord, giving off nerves between each separate bone. A ring of cartilage is seen inserted between each separate vertebra, the object of which is to prevent any jar reaching the brain when we run, jump, walk or stumble.

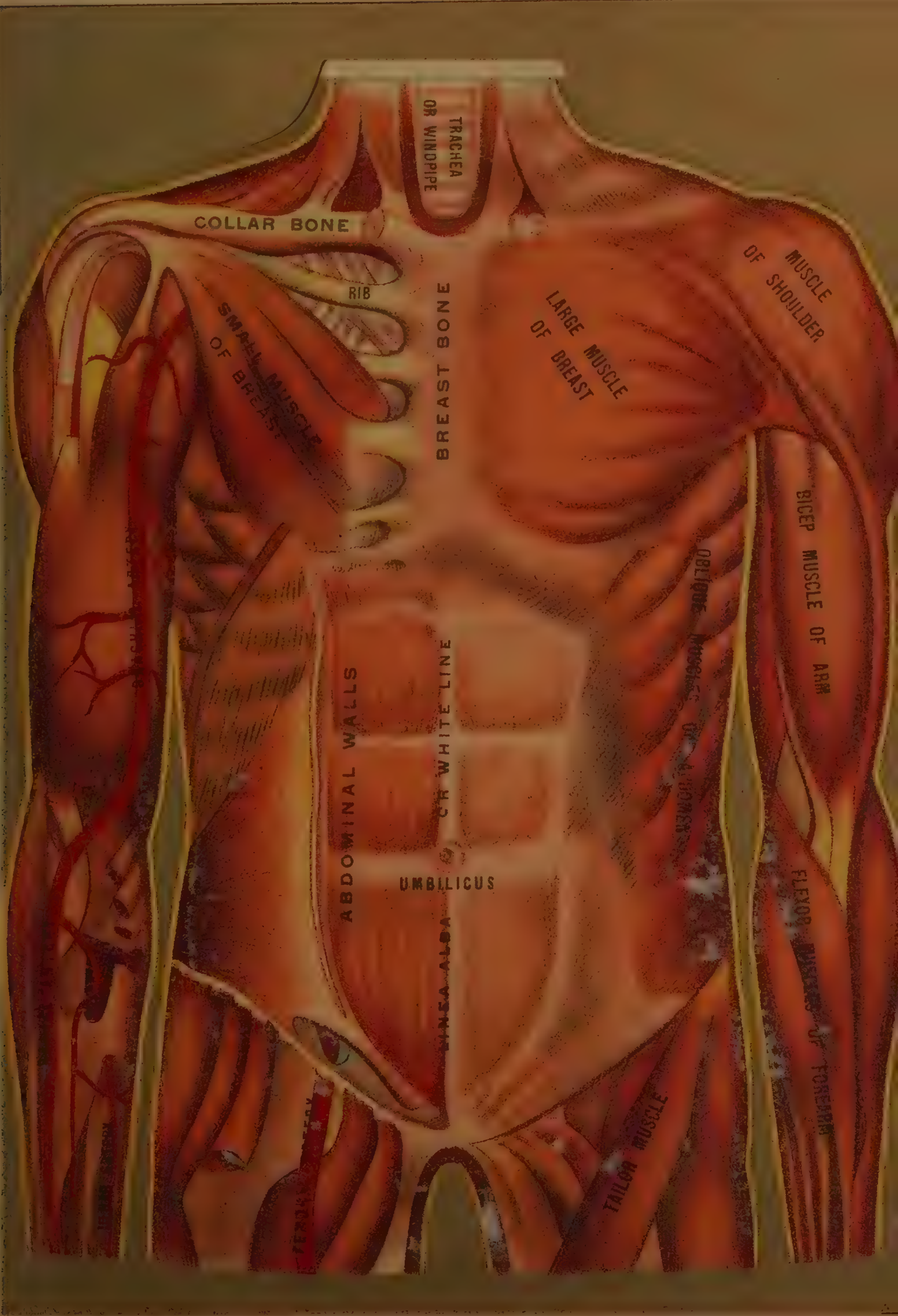
CHART II.

THE INTERNAL WONDERS OF THE HUMAN BODY REVEALED.

THE HUMAN BODY AND ITS MARVELOUS PERFECTION.

Wonderful Structure of the Body.—The human body is the highest form of animal life. It is full of beautiful proportions and divinely symmetrical in shape, form, mould and outline. We look with honest pride and glowing admiration upon the many accomplishments that man has achieved in the world around us. We see his skill displayed in the various arts and sciences, and we look with awe upon the projects of his intellect and reason, the realization of which is but a small question of time! We boast of our ships, our steamboats and our steam cars; we are justly proud of our bridges, our viaducts and the progress of our engineering skill; we grow enthusiastic over our telegraphs, our telephones, our electric lights; we feel a degree of national pride in the achievements and successes of Edison, the wizard of Menlo Park; but where, let us ask, in the whole range of events, the acquirements of arts, the accomplishments of mechanics, the achievements of architecture, the attainments of engineering, or the successes and promises of electrical sciences, can we find such another structure as the human body, that curious, yet perfect world of wonders!

Man the Most Complex Body.—It embodies an epitome of the whole universe! Man is more elaborate, more complex, more God-like, than any other living organism; more wonderful, more beautiful, more marvelous, than any work of human ingenuity, conception or construction.


TRACHEA OR WINDPIPE
COLLAR BONE
RIB
BREAST BONE
SMALL MUSCLE OF BREAST
LARGE MUSCLE OF BREAST
MUSCLE OF SHOULDER
BICEP MUSCLE OF ARM
OBLIQUE MUSCLES OF STOMACH
BRACHIAL ARTERY
ABDOMINAL WALLS
OR WHITE LINE
UMBILICUS
LINEA ALBA
FLEXOR MUSCLES OF FOREARM
TAILOR MUSCLE
FEMORAL ARTERY

Indeed, the mechanism, the skill and the workmanship displayed in the human body is simply perfection itself. In conception, it is divine; in design, perfect; in architecture, grand; in construction, wonderful; in beauty, lovely; in form, symmetrical; in outline, sublime; in strength, great; in arrangements, marvelous; in mobility, transcendent; in adaptability, unexcelled; in fine, when studied in all its parts and their relationship to each other, we are led to exclaim with the Psalmist David, that the human body is "fearfully and wonderfully made."

Man the Most Complete Body.—The all-wise Creator, when He first made man, made him perfect. He formed every organ of the body with direct reference to the function to be performed. Every bone, muscle, nerve, organ and tissue formed in the construction of this wondrous organism is made of the right kind of material; is of the proper form and size; placed in the right position to subserve best the purpose for which they were individually and collectively designed, and to perform the peculiar duties assigned to each. We cannot talk with the ears, smell with the eyes, see with the nose, nor walk with the tongue. We cannot think with the lungs, nor breathe with the brain. The stomach was not designed to propel the blood over the system, nor the heart to digest food.

The Complete Organs and Structures.—The muscles which give form and shape to the body would be powerless instruments of movement if devoid of the bones of the skeleton. Thus we see that every organ and structure was formed with direct reference to the accomplishment of a certain definite object. Hence, the bones form a frame work, to protect the delicate organs of mind, respiration, circulation, digestion and excretion, to serve as levers on which the muscles may act to produce motion, and to preserve the form and shape of the body; the muscles, such as we observe in this plate, give form, shape and symmetrical proportions to the body, and produce its varied motions; by means of the brain we think, feel and act; the nerves of the eye take cognizance of external objects, and convey their impressions to the brain; the auditory nerve distinguishes sounds; the olfactory nerve identifies and separates the different odors brought into contact with it, and the sentient nerves of the skin are fully impressed with the touch of external objects, carry the impression of their character and size to the brain, and the motor nerves carry the commands of the will to the muscular system, that the behests of the mind may be obeyed and carried out; the heart receives the impure blood from all parts of the body, and sends it to the lungs to be purified, then receives it back again and forces it with enormous power even unto the most remote and minute part of the system; the arteries and veins are made for the express purpose of conveying the "pabulum of life" from the heart, and to carry the vitiated and poisonous fluid to the heart; the lungs throw off the carbonic acid in the venous blood and replace it by oxygen; the stomach, by and with the aid of the salivary, biliary, pancreatic and intestinal juices, digests the food and transforms it into blood; the kidneys are designed as filters, to aid in the purification of the blood; thus we observe that the various tissues and organs of the body have each their own especial use in the human economy, and their exact and definite function to perform; and as a result of the sum total of the proper required performance of all these different functions, we have not only harmony and health, but happiness of mind, soul and body as well.

MUSCLES OF THE TRUNK OF THE HUMAN BODY.

Muscular Arrangement and Blood Supply.—In this exquisite and magnificent colored engraving we have a grand view of the wonderful arrangement of the muscles of the trunk of the human body, together with the muscular arrangement of the arms and likewise their blood supply. The trunk of the body is divided into two compartments—the thorax and abdomen.

The Thorax.—The thorax derives its name from the Greek word *thoreo*, and signifies "I leap," because the heart leaps in it. It is covered on the front part by large muscles; the pectoralis major, or large muscle of the breast, is observed on the left side of the chest, whilst on the right it is removed and exposes the pectoralis minor, or small muscle of the breast. The dove-tailed muscle observed on each side is the serratus magnus, and is employed in expending and contracting the chest in the act of breathing. The muscles of the chest walls, in a deep inspiration, exert a force equal to lifting a weight of 750 pounds.

Walls of the Abdomen.—The muscular walls of the abdomen are nicely arranged and beautifully adapted to the functions they perform. On the left side we see the large oblique muscle, so named because of the direction its fibres run, and on the right side we observe the rectus muscle, the transverse muscle and internal oblique muscle, all of which are strong, broad muscles, whilst the manner in which they are so scientifically arranged gives additional strength to the abdominal walls, without deteriorating from its great mobility, and at the same time avoiding all pressure of the organs contained within this large cavity. There are ninety-one muscles on each side of the trunk, or one hundred and eighty-two in all, ninety of which are pairs, and two are single.

Muscles of the Shoulder.—The large triangular muscle of the shoulder—the deltoid—is one of great strength, as in fact are all the muscles of the arm. If you grasp the arm tightly just above the elbow-joint, and then bend the fore-arm, you will feel the biceps muscle of the arm become firm, hard and prominent; now straighten it again and it becomes relaxed, whilst the muscles on the back of the arm become hard and prominent. The muscles of the fore-arm are the flexors and pronators; that is they flex the arm and turn the palm downward. In each upper extremity or arm there are fifty-three muscles, and we observe here the nicest and most economical method of packing away the muscles that could be improvised, securing strength, giving elegance to its form and shape and facilitating its mobility.

Blood Supply of Arm.—On the right arm we obtain a glimpse of the blood supply of the arm; we see the brachial artery giving off numerous branches, and observe the radial and ulnar arteries doing the same thing; thus securing ample nourishment to preserve the health, strength and beauty of the arm.

BONES OF THE TRUNK AND ARMS.

Different Forms of Bones.—On turning over this flap we are brought face to face with a grim looking but useful object—the frame work of the trunk and arms. The skeleton is of a ghastly appearance and emblematic of death; its unsightly look sends a thrill of horror through us and we instinctively recoil from it. Yet it subserves a useful purpose in the human body, and the ugly looking bones, when carefully examined, abound in nice contrivances and ingenious workmanship; whilst each individual bone is designed for the especial duty it has to perform. Hence the bones differ in form; some are long, as in the arms and legs; some are short and thick, giving strength and compactness, as in the lumbar portion of the spine; some are flat, for covering a cavity, as the skull and pelvis, and others used for a special purpose are irregular, as in the hands and feet.

Combined Lightness and Strength.—But notwithstanding this diversity in form, the general plan constantly kept in view by the Divine Architect has been the central idea of combining lightness with the greatest possible degree of strength. The bones of the arms and legs are round, or triangular, and hollow, thus giving with the same weight a greater degree of strength than if solid, besides affording a larger surface for the attachment of muscles.

Composition of the Chest.—The chest is composed of bones, cartilages and ligaments. Its natural form is that of a cone diminishing upward; and it affords lodgment for the heart, lungs and large blood-vessels. Its walls are formed posteriorly by the seven dorsal bones of the spinal column, and the ribs as far as the angle, the sides by the body of the ribs, and front by the ribs, the costal cartilages and the breast bone.

The Ribs.—The ribs are twenty-four in number, arranged in pairs, twelve on each side of the chest. At the back they are fastened to the spine, and in front the seven upper pairs are tied by cartilages to the breast bone, three are fastened to each other and the cartilage above, and two, the floating ribs, are loose. The long slender ribs give lightness; their arched form confers strength, and the cartilages impact elasticity; thus the three most essential pre-requisites of the chest for the protection of the delicate organs contained within this cavity are secured, whilst the freest motion in respiration is ensured.

The Pelvis.—The pelvis is an irregular-shaped basin, formed by the hip bones and the pubic bones in front. In the upper and back part is the foot of the spinal column, consisting of a wedge-shaped bone called the sacrum. It is observed firmly planted between the wide spreading hip bones of the pelvis, like the key-stone of an arch, and gives a strong support to the burden above.

The Spinal Column.—The spinal column, the lumbar portion of which is here seen, consists of twenty-four bones, between which are placed pads of cartilage. Such is the elasticity of these cushions of cartilage, that, though they become condensed through the day, making us shorter in the evening than in the morning, they resume their normal thickness while we are lying in bed at night. The perfection in the architecture of the spine surpasses belief; its various uses seem a bundle of contradictions.

Bones of the Spinal Column.—The twenty-four bones of which it consists are so stiffly locked together as to form a chain that will bear and support the heaviest of burdens, yet so flexible that it will bend like India rubber; within this wondrous column hides a delicate nerve that would thrill at the gentlest touch, yet so securely does it rest in its bony couch that it feels not the slightest jar or shock; and resting upon this remarkable pillar of bones is borne the brain without a tremor or a fear of danger; to it are found clinging the vital organs of the chest and abdomen, secure in the protection it affords.

The Shoulder Joint.—The shoulder joint, formed as it is by the shoulder-blade (scapula), collar bone (clavicle), and the arm bone, is most beautifully designed and executed. It comprises a shallow ball and socket-joint, thus affording the freest rotary movements. The shallowness of the socket, however, accounts for the frequent dislocations of this joint; but that is compensated for by the easy, graceful carriage and swing of the arm, which a deeper socket would not permit.

The Collar Bone.—The collar bone is fastened at one end to the breast bone and first rib, and at the other end to the shoulder blade. It thus holds the shoulder-joint out from the chest, aids in protecting the important vessels of the axilla, and gives the arm a greater range of freedom, mobility and play.

THE LUNGS; THEIR MECHANISM AND WONDERS.

What the Lungs Are.—The lungs! Dense looking objects, and yet how light and buoyant! This beautiful anatomical chart shows us a front view of the chest and lungs, with the lungs enclosed within the bony basket-work of the chest. The lungs are two large, conical bodies, placed one on each side of the chest, and occupy the greater part of its cavity. During life they accurately adapt themselves to the varying dimensions of the chest; for, unhappily, the foibles of fashion very frequently cause restriction of the lungs, by interfering with the resistance and freedom of movement of the ribs, so essential to health, by tight lacing and the barbarous usage of corsets.

Pleura of the Lungs.—In this chart we see also the pleura or the investing membrane of the lungs, and right below it the diaphragm or midriff.

Two Distinct Lungs.—Although the lungs are two in number, as far as their structure is concerned, and are perfectly distinct from each other, having, as we observe in the chart underneath this one, the heart and blood-vessels between them, yet as regards their functions they may be considered the same, since they receive their blood from a single vessel, the pulmonary artery, and the air by one canal, the trachea or wind-pipe, and act in common with each other.

Size and Shape of Lungs.—As will be observed, the lungs are not quite the same size or shape; the right lung, although somewhat shorter and thicker than the left, is the larger and stronger, being divided into three lobes; whilst the left is the smaller and weaker, divided into two lobes only, and hence more frequently subject to disease.

Weight and Shape of Lungs.—The weight of the lungs varies very much; but in general they average about forty-two ounces in the male;

thirty-six in the female; the right lung being about two ounces heavier than the left. Each lung is conical in shape, with a broad concave base resting on the convex surface of the midriff, the apex directed upward and extending into the root of the neck about one inch above the level of the first rib.

Interior Arrangement of Lungs.—On turning this flap over we find a vertical section of the lungs, showing their interior arrangements. The lower end of the trachea divides, one portion going to each lung. These again subdivide and continue to subdivide in geometrical order, growing smaller and smaller with each division, and extending to every part of the lungs, finally terminating in a cluster of air cells, bound together by cellular tissue and forming a lobule. These lobules vary in size accordingly as they are located on the surface of the lung or deeper in its tissues. Each lobule is separate and distinct from the other, and forms in itself a perfect and independent lung in miniature.

Function of the Lobules.—In this arrangement we see the boundless wisdom of the Creator displayed, for were it not for this wise and perfect provision—one of the very greatest importance in the process of respiration, since it enables each individual lobule to perform its functions independently of the rest—tubercular disease, bronchitis and inflammation of the lungs would not only be incurable, but would prove to be very rapidly fatal.

Lung Air Cells.—Each air cell varies in size from the seventieth to the one two-hundredth part of an inch in diameter. The number of air cells in the two lungs is truly surprising, there being certainly not less than 600,000,000, though according to Dr. Addison's computation there are 1,700,000,000, equivalent to 1,500 square feet of surface on which the process of purifying the blood is constantly and continuously going on in a healthy lung.

Blood-vessels.—On the next flap we have a graphic illustration of the internal arrangements of the blood-vessels of the lungs and bronchial tubes. The pulmonary artery, arising from the right ventricle of the heart, conveys the venous blood to the lungs. It penetrates the lungs and divides and subdivides into branches, which accompany the bronchial tubes and terminate in a dense capillary net-work upon the walls of the air cells, where the blood undergoes that magical change, giving up its poisonous qualities and becoming revivified and healthful.

Pulmonary Veins.—From this net-work of arteries and air cells the radicles of the pulmonary veins arise, and, coalescing into larger and larger branches, at length accompany the arteries and return the blood to the left auricle of the heart in a purified condition. The pulmonary arteries and veins differ from the same vessels in other parts of the body, since the former conveys venous blood, and the latter arterial blood.

Breathing.—Respiration, or the act of breathing, consists of the alternate inspiration and expiration of air to and from the lungs; in the process of which the lungs themselves are almost passive instruments, since their contraction and expansion takes place by means of the muscles which surround the chest. The diaphragm or midriff, which, when at rest and the lungs empty, forms a beautiful dome to the abdominal cavity, becomes depressed during the inspiratory process, and presses the walls of the abdomen outward. At the same time the ribs become elevated, thus increasing the size of the chest. Thereupon the elastic lungs expand to occupy the entire space, whilst the current of air, in obedience to a well-known physical law, rushes down the wind-pipe and enters the numerous air-cells, the result of which is *in*spiration. In expiration the reverse of this takes place. We bend forward, draw the abdominal walls inward, press the diaphragm upward, whilst the ribs are pulled downward. All these acts simultaneously performed decrease the size of the chest, and force or expel the air from the lungs.

Breathing Capacity of Lungs.—The breathing capacity of the lungs bears a close correspondence to the stature of man. For an ordinary-sized man of about five feet eight inches in height, it will be 230 cubic inches, or about one gallon of air, and for each additional inch in stature up to six feet, there will be an increase of eight cubic inches. In a forcible expiration all the air in the lungs is not expelled; there still remains behind 100 cubic inches. Thus with this unexpelled air, the breathing capacity of an ordinary-sized man is about 330 cubic inches, or equivalent to 11 pints of air. Of the 230 cubic inches, 100 can only be forced into the lungs by the exercise of great effort, and is available for emergencies, as striking a heavy blow, or for the purpose of training, as in singing, rowing, running, climbing, etc.; but the extra amount of air always on hand in the lungs is of great value, since it enables the lungs to perform their functions continuously, even under severe and violent exertions.

Giving Up of Oxygen.—The atmospheric air laden with its life-sustaining properties, oxygen, having passed into the lungs, gives up that vital element and receives in its place the carbonic acid gas, water, and other refuse materials which the blood has picked up in its journey through the body, and which are no longer fitted to circulate in the blood and preserve the vitality of the body. No tonic invigorates so well as a few, deep, full inspirations of pure cold air.

Circuit of the Blood.—The blood thus purified passes back to the heart to go on its circuit through the body, every organ of which renews its energy and vigor from the magician's fiery wand, pure, healthy blood; while the air exhaled carries off the impurities.

Change in Color of the Blood.—During this process the blood changes from a dark purple to a bright red. Pure air is the cheapest necessity and the greatest luxury of life. Let it not be the rarest. The relative proportion of the respirations to the pulsations of the heart is about 1 to 4½ or 5; and the quantity of air required to keep the blood pure is very great. Indeed, respiration is the falling weight, the bent spring, which keeps the clock of life in motion; the inspirations and expirations are the strokes of the pendulum which regulates it.

Delicacy of the Organs.—The perfection of the organs which carries on this stupendous office challenges our warmest admiration. So delicately are they arranged that the slightest pressure will cause intense pain, yet tons of air surge to and fro through their intricate passages, and bathe their innumerable cells without our knowledge, so to speak, of its coming and going. We annually perform over 8,400,000 acts of breathing, inhale over 150,000 feet of air, and purify nearly 4,000 tons of blood! This gigantic and unburdensome process goes on constantly, never wearying or worrying us when in robust health, and we are struck dumbfounded with amazement when the cold calculations of science reveal to us its magnitude and marvelousness.

Second Use of Breathing.—Nor is this stupendousness all. Nature dislikes a waste of energy. In addition to and by a wise adaptation and economy, the process of respiration is made to subserve a second use no less important than that of purifying the blood—the power of speech. The exhaled air, laden though it may be with the human detritus and off-scourings of the body, in passing through the vocal organs can be transformed into prayers of faith, songs of hope and words of good cheer, kindly encouragement and expressions of love!

THE HEART AND ITS WONDERS.

What the Blood Is.—The blood—the pabulum of life—has not inaptly been termed "Liquid Flesh." But it is more than that, since it contains the materials so essential and so requisite for the building up and repair of every organ and tissue of which the body is composed. The blood is the liquid by means of which the circulation in the body is carried on; it permeates every nook and corner of the system, and is composed of a thin, colorless fluid, the *plasma*, filled with red disks, so small, flat and thin that it requires 3,500, placed side by side, to measure one inch, and no less than 18,000, placed one upon the other, to make a column one inch in height. These disks are continually forming and as constantly dying.

Coagulation of the Blood.—According to Dr. Draper, of New York, 20,000,000 die at a single breath! Blood when exposed to the air coagulates, and the value of this peculiar yet intrinsic property cannot be overestimated. When an artery is ruptured bleeding takes place, the blood coagulates and forms a plug, thus preventing further hemorrhage. Thus we observe with what Divine foresight and wisdom, not only the wants of the body are provided for, but also the accidents to which it is liable.

Size, Shape and Location of the Heart.—In this beautiful anatomical chart we obtain an accurate idea of the relative size, shape and position of that wonderful engine, the heart, whose tireless efforts to keep the wheels of life in motion are truly surprising, and fill us with amazement at the prodigious work it daily performs. The heart is an irregular, pear-shaped, hollow, muscular organ, placed obliquely in the lower and front part of the chest, between the two lungs and inclining to the left of the centre. The base is directed toward the spine and corresponds with the fourth and fifth dorsal spinal bone, while the apex points between the cartilages of the fifth and sixth ribs on the left side. In this illustration the pericardium, or loose sac in which the heart is enclosed, is removed, and we see the coronary artery with its branches distributed over the outer surface of the complex and restless organ.

Heart a Double Organ.—On looking at the heart one would think it was a single, solid organ. It is not, however, but a double organ, divided into four compartments; the two upper ones, from their supposed resemblance to a dog's ear, are called auricles, and the lower ones, from resembling a little stomach, are called ventricles. The auricle and ventricle on each side communicate with one another, but the right and left halves of the heart are each separate and distinct organs, and perform different functions—the right side propels the dark, vitiated and impure blood, whilst the left deals with the bright crimson, life-giving and life-sustaining blood.

Use of the Auricles.—The auricles serve as reservoirs to receive the blood—the right, as it comes dark and foul from its tour of the body; the left, as it filters bright and pure from the oxygenated forest of the lungs—and to furnish it to the ventricles as they need it. This is graphically shown on the chart, the large blue vein, formed by the jugular and subclavian veins, is seen descending downward and emptying into the right auricle; the red pulmonary vein, formed by the coalescing of its numerous branches, conveying rich, pure blood from the lungs and depositing it in the left auricle. Corresponding to the lightness of the work they perform, the walls of the auricles are comparatively thin and weak.

Ventricles of the Heart.—The walls of the left ventricle, which propels the blood to the remotest corners of the human frame, are correspondingly thicker and stronger than those of the right, which forces the blood to the lungs only. Arising from the right ventricle is seen the blue pulmonary artery, conveying its foul, poisonous, vitiated and venous stream to the lungs, while from the left ventricle is observed the large main artery of the circulatory system—the aorta—from the arch of which arise the right and left carotid arteries.

Changes in the Human Body.—The human body is in a constant state of change. In the midst of life there is death. The blood disks die and new ones are born into life. Every act of life is destructive as well as constructive. Not a thought can be evolved but numerous brain cells die; not a wink of the eye, a smell of a lovely rose, nor a muscular movement, but results in the death of some part of the machinery involved. Every process of life is a process of death. The scales of the epidermis are constantly falling off and being replaced by fresh cells from beneath, and it is on the continuance of this interchange that our life, health and vigor depends. The more rapidly this change goes on, and fresh, vigorous, healthy tissues take the place of the old lifeless ones, the more elasticity, buoyancy and strength we possess—the more healthy and robust we become.

Work of the Heart.—No slave ever performed his work more patiently than the heart. Its quivering task is essential to life and health. It is the fountain from whence the spirit flows, and on the faithful performance of its functions every part of the body depends for the warm stream of life, motion and vigor which it unstintingly furnishes. The ancients believed the heart to be the seat of love. Within its walls were located all that was pure, true, good and noble, as well as the evil passions of the soul. And although modern science has found the seat of mind, reason, consciousness and the mental powers to be located in the brain, and thus robbed the heart of its romance, yet it has revealed wonders connected with this small organ, that certainly eclipse the mysteries associated with it in the past. Pit-a-pat! pit-a-pat! throbs this marvelous engine, and in response to its constant throbbing the blood bounds along the myriad of tubes, conveying messages of life and health.

Constancy of Heart Work.—Our mind cannot stop its beatings; it cannot stop itself; sleep does not interfere with its workings, and our daily labor only strengthens its force and regularity. This wonderful organ throbs on night and day, week in and week out, the year round, with ceaseless, tireless energy. It beats at the rate of 100,000 strokes per day, 40,000,000 per year, and not unfrequently, 2,800,000,000 without a single stoppage. It is the most powerful engine known to science. Its daily work is equal to one-third of that of all the muscles of the body. If it should expend its entire force in lifting its own weight vertically, it would rise 20,000 feet in an hour. The greatest exploit ever accomplished by a locomotive was to lift itself through less than one-eighth of that distance. Vast and constant as is this perpetual throbbing, so perfect is the machinery with which it is carried on, that there are those who do not even know where the heart lies until disease or accident reveal its location.

Vitality of the Heart.—Its vitality is as amazing as its strength. While life exists this tireless organ never stops. In disease, as long as a flutter of this wondrous organ exists, we know the spark of life has not altogether vanished, and new hope is begotten that health may be restored. During such long lives as we sometimes see, the heart has propelled no less than 500,000 tons of blood; and yet, during all this patient, unfaltering and unflinching labor, it has repaired itself as the waste has occurred.

Heart Rhythms.—The rhythm of its beats never fails until death breaks into the casket and seizes the never throbbing pendulum at the command of the great Master Workman, silencing the quivering muscles of the heart and compelling the wheels of life to stand still.

THE DIGESTIVE APPARATUS AND ITS WONDERS.

Value of the Plates.—Seeing is believing; nay, it is more, it is knowing and remembering. The mere reading of a statement on any particular subject does not always advance our knowledge of the matter in question. The observation of a fact, or its proper illustration by appropriate diagrams, such as we observe these anatomical charts to be, not only emphasizes the point considered, but aids us in remembering the principal features connected with the functions performed, thus advancing our knowledge of the subject discussed, and educational progress is made.

Quantity and Variety of Foods.—As we have already seen, the human body consists of numerous mechanics or artisans, who are constantly at work repairing and upbuilding the unceasing destruction that is continually going on. If fresh food be not daily supplied, this work would soon cease, and the lamp of life flicker out. To replace this constant waste we require nearly three pounds of solid food, and fully three pounds of liquid food for our daily allowance. But to convert the pent-up energies of bread, meat and vegetables into the tissues of our own mechanism requires a number of differently constructed organs, and these we now desire to draw your attention to in this beautiful chart. The organs consist of the stomach, liver, pancreas and intestines, which comprise the principal organs concerned in the process of digestion.

The Stomach.—The stomach is an irregular expansion of the gullet or œsophagus, and is the receptacle which receives the food when swallowed. Its shape has been, not inaptly, likened to the Scotch bagpipe. It will hold about three pints, though it is capable of considerable distension. When moderately filled with food it measures about twelve inches in length by four inches in diameter at its widest end. The walls of the stomach consist of four distinct coats, held together by fine areolar tissue, and are arranged in the following order, from within outward: the mucous, the areolar, the muscular, and the serous. The inner mucous coat is a smooth, soft, rather thick, pulpy membrane, loosely connected with the muscular coat, and secretes the gastric digestive fluid of the stomach.

Fine View of Stomach Coatings.—On turning over the flap we obtain a very fine view of this remarkable membrane. The areolar coat is placed between the muscular and mucous coats, and connects with both. The muscular coat is very thick and stout, and composed of three sets of fibres, the longitudinal, circular and oblique, which form three distinct layers. The outer coat is a thin, smooth, transparent and elastic membrane, derived from the peritoneum, and well lubricated to prevent friction. When the fibres of the muscular wall contract, a peculiar churning movement of the stomach is produced, thus securing the thorough mixing of its contents, that every particle may come into contact with the solvent properties of the gastric juice.

The Pyloric Gate.—At the smaller end the muscular fibres contract and form a gateway—the pylorus, as it is called—which carefully guards the exit from the stomach, and allows no food to escape until properly prepared. The gastric blood-vessels are seen distributing themselves over the outer surface of the organ, thus ensuring its nutrition and repair.

The Liver.—The liver is the secreting organ by which the bile is formed. It is situated on the right side below the diaphragm, and is of a reddish-brown color. It is irregular in form, being convex on the upper surface, irregularly concave behind, very thin in front, and weighs about four pounds. It is, therefore, seen to be the largest organ or gland in the body. It is divided into two lobes, the right and the left, the former being by far the larger. On turning the flap over, we see how intricately it is arranged internally.

Blood-Vessels of the Liver.—The blood-vessels of the liver are the hepatic artery and veins, and the portal vein; the lymphatic vessels are numerous, and the nerves are supplied from the pneumogastric, the phrenic and the hepatic plexus. The liver, therefore, receives two kinds of blood: the arterial, by means of the hepatic artery, and the venous, from the portal vein, from which the bile is principally formed. The bile is a dark, golden fluid, of extremely bitter taste, of which three pounds is secreted daily. When not used in digestion it is stored away in the gall-bladder, a fine view of the location of which we have in this chart. The action of the bile on food, though not fully understood, is necessary for perfect digestion.

The Pancreas, or "Sweetbread."—The pancreas, or "sweetbread," is a single glandular organ; situated transversely across the upper and back part of the abdomen, on a level with the last dorsal spinal bone. It is of an irregular, elongated form, from six to eight inches in length, an inch and a half in breadth, and from a half to one inch in thickness. It secretes about seven ounces daily of a slightly alkaline fluid containing an organic principle—pancreatin, which has the property of changing the starchy food into sugar. Whilst it has this power, yet its chief work in the digestive process seems to be the breaking up of the fat globules into myriads of minute particles which mix freely with water, and thereby promote their absorption by the lacteals.

The Intestines.—The next chart shows us the manner in which the intestines are arranged in the abdominal cavity. The entire intestinal canal is about thirty feet in length, and is divided into two portions—the small intestines, and the large intestines; these again are each subdivided into three different portions. Of the large intestines, the transverse portion is laid open, showing the internal arrangements. A section of the bladder is seen on this chart.

Machinery of Digestion.—From the number and differently formed structures which constitute the digestive organs, it will be observed that that function is a very highly complex process. If the food were thrown directly into the circulating fluid, it could not be used for the purpose of nutrition. It requires for its transformation into blood, bone and muscle, a series of complex machinery, each part of which is specially designed for the particular part it plays in this wonderful and complicated process.

Use of Mouth and Teeth.—The mechanical part, which, although not shown in this chart, may be carefully studied in the chart giving the different views of the head, is performed by the mouth and teeth, and the pulverized food is subjected to the action of the saliva. The lubricated morsel of food is now gathered into a ball and conveyed to the back of the mouth by the muscles of the cheek and tongue. On its arrival here, the soft palate lifts upward and closes the posterior nasal openings; the epiglottis shuts down over the trachea or wind-pipe, forming a bridge over which the food passes, thus preventing it from falling into the respiratory track.

Duty of the Throat.—The muscular bands of the throat now grasp it and pass it down the gullet into the stomach, beyond our control. Here it comes into contact with the gastric juice, undergoes the churning motion of the stomach, is guarded over by the pylorus, thoroughly saturated and mixed before entering into the intestinal track, where it is subjected to the action of the bile, the pancreatic juice and the intestinal fluid, each with its special duty to perform.

Nature's Treasures Open to Man.—All this is a very complicated and diversified process, the necessity for which can only be explained upon the hypothesis that Nature, in her exhaustless munificence, has opened her proud domains, and poured forth to man the treasures of every land and every sea for food; the cornfields wave their golden grain for him; the wheat, rye, oats, corn, maize, rice, each different, yet highly nutritious and sufficing; the palm, the date, the banana, the fig, the pineapple, spread out a delicious harvest on the air; the luscious apple, pear, peach, plum, cherry, tempt his ready hand; the potato, the beet, the turnip, the tomato, the cabbage, the pea, the cauliflower, and a thousand other good things, incite his appetite, whilst to this feast is added the flesh of birds, of oxen, of sheep, of swine and of fish; that before the waving wheat and corn, the flesh of other animals, the fruits and farinaceous foods, the running water, the luscious oyster and fish, etc., can be transformed into the refined and spiritual organization of man, it must be thoroughly prepared by the several steps in the digestive process—then, and only then, is it permitted to enter into and commingle with the highly complex, nutritious and life-sustaining fluid, the blood.

Great Value and Beauty of the Plate.—We can understand much of this wonderful process. We have looked into the stomach, watched its peculiar actions and traced its various steps, from which the scientist is capable, in his laboratory of knives, mortars, baths, chemicals and filters, of imitating many of the operations of digestion; but just at the moment he thinks himself most successful, he is compelled to pause. At the threshold of that "one step more," which Fontenelle required, "and he would surprise nature herself," he stops, and very wisely, without concealment of his designs, admires, then wonders, and finally worships with all the reverence of his soul.

Transformation of Food Into Flesh.—How strange this is—the transformation of food into human flesh, into human thoughts! We eat a meal; it is composed of meat, bread, vegetables and liquids. The more solid part is ground by the teeth, mixed with the different juices, dissolved, changed, organized and is swept through the body in the circulation of the blood. Each organ seizes its own particular food as it passes. Within the cells of the various tissues it is transformed into the soft, sensitive brain, or the hard callous bone; here into the nerve of sight, there into gristle or tendon; here briny tears are formed, there the bland saliva; in the stomach, acid juice; in the skin, acrid perspiration; bile for digestion, oil for the hair, nails for the fingers, muscle for the strong arm of toil, and flesh and fat to give shape, form and beauty to the face.

Wonderful it all is.—Wonderful! Within us is an Almighty Architect, who superintends a thousand skilled laborers, that make a way which puzzles human comprehension; here a fibre of muscle; there a filament of nerve; here constructing a bone; there uniting a tendon—fashioning each with the most scrupulous care and unerring nicety. Without the buzz of a saw, or the sound of a hammer; without the slightest compression, or the least particle of noise; with a regularity, certainty and exactness, the glorious temple of man, in the image of his Creator, goes up and up, day by day, skilfully put together by these noiseless, tireless and expert workmen.

THE VERMIFORM APPENDIX.

The chart brings into view the location and form of that wonderful little organ known as the Vermiform (wormlike) Appendix (appendage). It is an appendage of the Cæcum, or lower bowel. Its uses as a bowel appendage have never been established. It occurs in other animals besides man. Notwithstanding its diminutive size and uselessness as an organ it is the seat of that most painful and dangerous disease called Appendicitis, which was formerly attributed to the presence of some foreign body, as a grape-seed, lodged within it. But it has been found inflammation of the Appendage may arise from numerous other causes.

Many doctors insist that a surgical operation, that is the entire removal of it with knife, is the proper curative agent, especially in acute cases. But others insist that the knife is too frequently used, and that the disease, if taken in time, is quite surely curable by absorption.

THE CLITORIS, URETHRA, VAGINA AND HYMEN.

These female organs show further the perfection which anatomical plate printing has attained.

Clitoris.—This small organ, it will be seen, is situated at the upper part of the vulva, or outside parts of the female generative system, and is usually concealed by the lips of the pudenda. It performs a function during sexual intercourse similar to that performed by the penis of the male.

Urethra.—This highly useful organ, common to both sexes, is, as will be seen by the plate, the canal, or medium, by means of which the urine is carried from the bladder to be voided. It is a delicately lined organ, furnished with retentive valves, and therefore susceptible to a variety of diseases.

Vagina.—This word implies a sheath, and is applied to the canal which leads from the uterus (womb) to the external organs of generation in the female sex. Commonly, it implies such external organs, or organ, as depicted in the plate.

Hymen.—The mucous membrane, or virginal membrane, at the entrance of the female sexual organ, or vagina.

BLADDER AND PART OF VAGINA.

The function and form of the bladder are familiarly known. It is the recipient of the kidney secretions, and contains them till voided through the urinary canal. It is of tough, elastic structure, guarded at the exit by a contractile valve, by means of which the urine can be retained until the quantity becomes excessive. The plate brings out the entire urinal tract, from the bladder to the vagina, and presents a fine and useful anatomical and physiological study.

WOMB, OVARIES AND VAGINA.

The Womb.—The plate beautifully and effectively illustrates the location and formation of the womb, that wonderful organ which performs the function of parturition, and which is so constructed as to assist in all the necessary efforts of birth. Its structure is elastic and strong, and it expands readily to accommodate the growth of the child (fœtus). While this is true exteriorly, its inner parts are rather delicately lined, and subject to a variety of painful diseases, generally designated as "Diseases of the Womb."

The Ovaries.—The organs are situated contiguously to the womb. They signify eggs from their shape, and they are the parts which the male semen acts upon to produce the phenomenon of pregnancy. Their enlargement by inflammation and their passage down the fallopian tubes, once a month during the middle period of female life, produces the condition familiarly known as menstruation. The plate also affords another view of the vagina.

NATURAL POSITION OF CHILD AT TIME OF BIRTH.

This beautiful and effective plate shows the natural position of the child at the time of birth. It is technically called the presentment of the fœtus for birth. Of presentments there are many varieties, whose study is most interesting to the obstetrician. Some of them give rise to very difficult and dangerous delivery. When the presentment is natural, as in the figure, the comfort of the mother is increased and the doctor's anxiety is much allayed.

VIEW OF THE LARGE BLOOD-VESSELS, SPLEEN, KIDNEYS AND BLADDER.

Blood-Vessels of the Body.—The blood-vessels of the human body consist of the heart, arteries, veins and capillaries. The heart and its wonders we have already referred to. In this magnificent chart we are enabled to form some idea of the larger blood-vessels. We see the main arterial tube of the body—the aorta—from a point where it unites with the arch of the aorta; and in its descent downward along the spinal column it gives off numerous branches.

The Arteries.—Opposite the fourth lumbar vertebra it is seen to split in two, and these divisions are called, from their position, the right and left iliac arteries. These are seen to divide again into the internal and external iliac arteries, the former of which is distributed to the walls and viscera contained in the pelvis, then proceeding to the lower limbs after sending two important branches to the abdominal walls. The arch of the aorta gives off the innominate artery, which divides into the right carotid and right subclavian arteries; the left carotid and left subclavian spring direct from the arch of the aorta. Each carotid artery divides into the external and internal carotid arteries, the former being distributed to the external parts of the face and head; the latter supplies the brain and internal parts of the cranium. The subclavian arteries supply the upper extremities with blood.

Intercostal Arteries.—The intercostal arteries and veins are beautifully illustrated in the chart. The veins return the blood to the heart. The large ascending and descending venæ cavæ are seen in this illustration.

Meaning of Artery.—From the fact that at death the arteries are empty, the ancients believed them to contain air, whence their name, derived from *aer*, air, and *tereo*, I keep, which literally means, *air ducts.*

The Spleen.—The spleen is a spongy organ, of a livid color, oval in figure and situated in the left upper part of the abdomen and immediately behind the stomach. Its weight varies from four to ten ounces. It is largely composed of cells, but its function is little understood, though from its position it is believed to be in some way useful to the stomach during the process of digestion.

The Kidneys.—The kidneys are two glandular bodies, having for their functions the secretion of urine. The form of the kidney resembles a French bean; its average length being from four to four and a half inches, two inches in breadth and one in thickness. The two kidneys are situated one on each side of the spine in the lumbar region, opposite the last two dorsal and two first lumbar vertebræ; they are of a brownish-red color, flattened from before backward, and grooved on the interior border for the reception of the great vessels.

The Veins.— The venal arteries are derived direct from the aorta; and the large veins terminate in the ascending large vein. On the right kidney is seen the super-renal capsule; whilst the left is cut vertically into showing the uriniferous tubes, much convoluted and inosculating with each other. The ureter is seen arising from the pelvis of the kidney, descending in an oblique manner to the bladder. These wonderful little organs appear to act as filters, and thus assist to keep the vital stream of life in as pure and as healthy a condition as possible.

The Bladder.—The bladder is a thin membranous bag, which serves as a receiver of the urine secreted by the kidneys, and which remains there until voided by urination through the urethra.

Bone Sections.—The sections of the bones show their cancellated appearance, which combines lightness with strength.

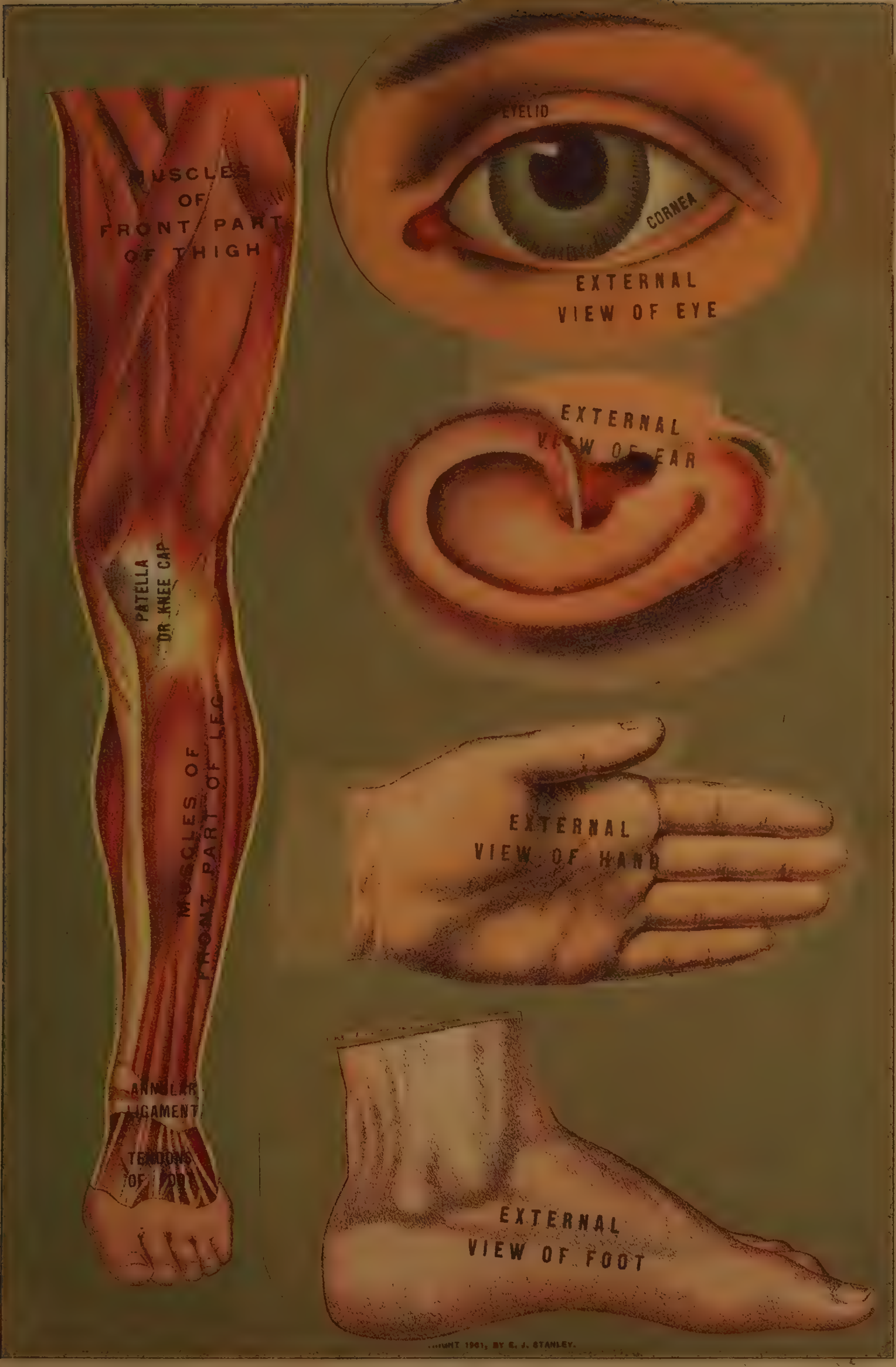


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CHART

CHART III.

WONDERS OF SIGHT, HEARING, TOUCH AND LOCOMOTION.

THE EYE AND ITS WONDERS.

Beautiful Plate of the Eye.—The beautiful flesh-colored engraving at the right-hand top corner of this exquisite composite anatomical plate gives a strikingly natural, life-size representation of the human eye, together with its external appendages, the eyebrows, the eyelids, and the lachrymal or tear glands.

Muscles of the Eye.—On turning the flap we see four of the six delicate, but withal strong muscles which not only hold the eye firmly in its bony orbit, but also move it upward toward the canopied vaults of heaven, downward to view the beauties of nature on earth; or sidewise, to the right or left, spanning half the horizon at a single glance! The next illustration gives us a graphic and faithful delineation of the beautiful arrangements of the numerous curtains, humors, lenses, pigments, membranes, nervous coats and blood-vessels which enter into the composition of this remarkable organ, each of which is exquisitely adapted to the respective functions it has to perform.

Wonders of the Eye.—The human eye is one of the most wonderful, as well as delicate, organs of the body. It is the window through which the heart, mind and soul of man shines. Sorrow or joy, grief or mirth, pain or pleasure, sunshine or shadow are reflected through this wondrous camera of light; the human passions hold their orgies in this window; truth and love dance their happy and joyous day-dreams before its luminous curtain; and through it accurate delineations of every object that comes within its range are carried to and photographed on the brain, the great art gallery of the soul! Can man, with all of his great and scientific achievements, conceive of anything in the arcana of his accomplishments more beautiful, more wonderful, or more perfect than the human eye!

THE EAR AND ITS WONDERS.

The External Ear.—The organ of hearing consists of three parts, the external ear, the middle ear or tympanum, and the internal ear or labyrinth. The external part of the ear represented in this colored engraving is very realistic of that essential appendage to this important special organ of sense in man. It consists of an expanded sheet of cartilage, folded in true trumpet fashion, for collecting the sound waves and conveying them to the external meatus or mouth of the auditory canal.

The Ear Drum.—On the back of this flap is seen a strikingly natural representation of the middle ear, the tympanum or drum, as it is frequently called. From the bottom of the tympanum is observed the Eustachian tube, through which is conveyed air from the pharynx to the middle ear. Across this chamber is seen stretched three very tiny, singular bones, which, from their shape, are called the hammer, the anvil and the stapes. These delicate bones are connected together, one by ball and socket joint, the other by a hinge-joint and by ligaments, and are moved by small muscles; they serve to convey the wave sounds across the tympanum cavity to the internal ear.

Show of Ear Canals.—The semicircular canals, and the cochlea, so named from its resembalnce to a snail's shell, are also typically shown. In the next colored illustration we observe a graphic and truthful view of the delicate internal arrangement and mechanism of the internal part of the organ of hearing. Here we observe the winding stair of the cochlea, over the surface of which the delicate fibrils of the auditory nerve expand, and the minute fibres of Corti, called from their discoverer, are seen arranged with geometrical precision, the longest at the bottom and the shortest at the top.

Wonders of the Spiral Plate.—If this curious and artistic spiral plate, which is seen to wind two and one-half times round, could be unrolled and made to stand in an upright position, it would make a beautiful microscopic harp, not of a thousand strings, but of three thousand strings, and if it were possible to strike these delicate infinitesimal cords as we can the keyboard of an organ or piano, every conceivable variety of tone that the ear can distinguish would be produced and conveyed to the brain as the product of sound.

THE HAND; ITS MECHANISM AND WONDERFUL ENDOWMENTS.

Engraving of the Hand.—To tell one that this exquisite colored engraving represents a human hand seems almost like questioning his sanity. Yet such it is; but how few there are who can give an intelligent account of the hand, describe its beautiful arrangements and complex mechanism, or tell of its wonderful endowments. Small in compass, compact in structure, yet so skilfully arranged are its blood-vessels and nerves, that they form a complete net-work over its surface. So minute are they in their distribution that the point of the finest needle cannot penetrate any part of the hand without piercing quite a number of them. The hand is the great organ of touch and prehension, and the instrument which distinguishes man in the large class of mammals, since he is the only animal which possesses two perfect and complete hands.

Bony Frame of the Hand.—On turning over this flap we behold the bony frame-work of this wonderful organ. It is seen to consist of a number of bones, so exquisitely arranged as to combine the greatest possible degree of flexibility and strength.

Palm of the Hand.—Below this is given an elegant, and at the same time a true and correct view of the muscular arrangement of the palm of the hand and fingers. Over the wrist is seen the annular ligament, that thin, tough, strong sheath, which binds the muscular cords and holds them firmly in place. Thus in these three anatomical charts have we depicted the perfection of the human hand.

Powers of the Hand.—And how varied and useful are its endowments! How wondrously adapted to the uses to which it is daily applied! Its elegance of outline, delicacy of mould and beauty of color has ever made it the attractive study of the artist; whilst its elasticity, flexibility and strength, combined with its delicate and exquisite mobility, and perfect adaptation as an organ of prehension, have led many philosophers to attribute man's high and graceful superiority even more to the hand than to the mind. Glowing thoughts are penned upon the pages of history by means of the hand; it wields the artist's pencil and brush, and makes the bare canvas an attractive and valuable work of art; now it strikes the keyboard of the piano with so delicate a touch that low, sweet, plaintive strains of music are brought forth; now the force of the blow is much greater and firmer, and louder and louder and more thrilling the musical strains.

Skill of the Hand.—The farmer's toil, the housewife's task, the dressmaker's deftness, the mechanic's skill, are all accomplished by the human hand. How constantly this little instrument aids us in expressing our feelings. It is the orator's chief aid in giving expression to his lofty strains of eloquence, or emphasizing his pathetic appeals.

Various Uses of the Hand.—With the hand we affirm or reject a proposition with more force than with the tongue. It is the first to greet, and the last to bid our friends good-bye. We use it to express our joy and pleasure, or to give vent to our fear and horror. In the hour of peril we employ it in powerful supplication to Him to whom we look for succor and help, and it adds force and power to the appeals of suffering, of sorrow and of woe. It bestows its loving caresses on the downy cheek of the baby, invokes the blessings of Heaven, pleads for mercy, or hurls curses on our enemies. Indeed, we do not always seem to realize how many notes in the tune of human life the hand of man is made to play. Its beauties, its perfect adaptability, its varied endowments, and the different uses to which it is applied, are almost beyond our thoughts, and he who is deprived of this useful member sustains a loss that none can estimate, nor the wealth of Crœsus compensate.

THE FOOT; ITS MECHANISM AND ITS WONDERFUL ENDOWMENTS.

Arrangement and Uses of the Foot.—In this exquisite colored engraving is represented the human foot, the organ by which we stand, walk or run. Look at it carefully, aye, critically, and see if you can duplicate it in the whole range of man's achievements! The general arrangement of the bony frame-work of the foot, as seen in this illustration, is strikingly like that of the hand. The graceful arch of the foot, composed by the tarsal and metatarsal bones, is firmly joined together by a thick layer of cartilaginous structure, not only preventing a liability to displacement, but giving to it an elasticity, sprightliness and strength which could never be attained by a single flat bone. In the next colored illustration we have a section of the foot, showing its architectural dignity and perfection. On its under or plantar surface are seen stretching from the heel forward toward the toes a number of ligaments, the principal one of which is the plantar ligament, and possesses great strength and elasticity.

The Toes.—The toes are observed to be straight forward in a line with the general contour of the foot. This is their natural position. The beautiful outline of the natural foot, as here represented in these several different views, the graceful arch of the instep, the elegance of its form, its marvelous elasticity and strength, all combine to make the foot not only of great perfection and beauty, but admirably fit it for the manifold duties it is called upon to perform. Man, in his diversified labors and varied trials throughout life, is sometimes obliged to walk, run, jump, leap, climb, stand erect, lean forward, etc., and he depends upon the foot to maintain his equilibrium in the performance of these several duties.

Beauty and Strength of the Foot.—Not only does the foot, too, frequently sustain heavy weights, but it must carry them as well. It likewise affords a firm support. Were it not for this beautiful mechanism, the constant jarring and concussion which would be experienced in the act of walking would inevitably destroy those delicate organs, the brain and spinal cord, and death would immediately follow. How few persons in civilized nations have perfectly natural feet! The beauty and utility of the human foot is marred; its movements are impeded by encasement in unnatural boots and shoes; these, instead of conforming to the form and shape of the foot, make the foot adapt itself to them. The consequence is corns, bunions, cross toes, ingrowing toe-nails, large joints, and a number of other evils from which so many suffer at the present day.

THE LEG; ITS MECHANISM AND ITS WONDERFUL ENDOWMENTS.

Leg Muscles.—In every part of the human frame there is witnessed ample evidence of design, beauty of architecture, great skill, finished workmanship, and a perfect adaptability to the duties to be performed. This fact is strikingly illustrated in the beautifully executed colored plate to which attention is now drawn, showing, as it does, at a glance, the thick, strong, muscular instruments employed and the manifold intricacies involved in the act of human locomotion. This exquisitely artistic anatomical plate represents a front view of the thigh, leg and foot, and of the fifty-four fleshy levers which give form, shape, symmetry, strength and mobility to this useful member of the body. Quite a number of the most important are seen exposed to view, after the skin and fatty tissues have been removed. We are deeply impressed with their large size and great strength, both of which correspond with the requirements demanded in the varied work which the leg is called upon to perform.

Use of the Leg Muscles.—The muscles observed in this plate are the principal instruments for carrying out the behests of the will in the acts of walking, running, leaping, climbing, and the graceful gliding motions of the entrancing and captivating waltz; and although we see a complicated piece of machinery, yet there is perfect order. Harmony, promptitude and exactness prevail, not only in the skilful manner in which they are individually and collectively arranged, but in the action of the different muscles, each one of which performs its duty either independently of, or in connection with, its fellow lever, and that, too, without interfering in the slightest degree with the functions of the others.

Muscular Levers.—These great muscular levers bend the body forward on the thigh, and bring the legs inward toward each other, besides moving the whole body to and fro when walking, etc. The long, narrow muscle, seen running obliquely across the thigh, is the Sartorius muscle, so-called from the fact that it crosses the legs for the sartorial (tailor's) posture. It is the longest muscle in the body.

The Knee-Pan.—The patella or knee-pan is seen held firmly in position, giving greater strength and security to this important joint. Around the ankle is observed the annular ligament, binding the long silvery thongs or tendons of the muscles of the legs, thus preventing their displacement. It also affords security and strength to the ankle joint, though not interfering with its elasticity and motion. The foot shows us the natural position and shape in which the toes should be when encased in a boot or shoe.

Thigh and Leg Bones.—On turning the flap we see the bones of the thigh and leg, and a front view of the bones of the ankle joint and foot. As was to be naturally expected, we here find the largest, the longest and strongest bone in the human body, since, with every step taken, it has to bear the entire weight of that wonderfully and fearfully constructed body, and support whatever additional burdens or weights one is called upon to impose in the course of his daily labors. The bone is observed to be compressed, somewhat cylindrical in shape, but expanded at both ends, thus giving it the greatest possible degree of strength. At its lower end it articulates, and forms a hinge-joint with the knee, the strength and protection of which is further secured by the shape and position of the knee-pan.

The Shin Bone.—The tibia or shin bone is also a very large, strong, triangular-shaped bone, enlarged at both ends; the lower end, however, where it articulates and forms a hinge-joint with the foot, is larger and more prominent than the upper end. And as if this bone was not sufficiently strong enough in itself to bear the weight of the body, our Creator, with that boundless wisdom and forethought which everywhere in the human frame we see revealed, strengthens the leg by an additional bone, which is seen running on the outer side of the shin bone, and to which it is firmly bound at both ends.

The Fibula.—Not only does this second bone—the fibula—give additional strength and support to the leg proper, but it likewise increases the bony area or surface of the leg, to which its powerful muscular levers are attached.

The Sciatic Nerve.—The large sciatic nerve, its position, course and distribution, is graphically outlined, and as we look upon this white, sensitive cord, we are deeply impressed with the force and truth of what Shakspeare makes one of his characters, *Timon*, say:

"——————— The cold SCIATICA
Cripples our senators, that their limbs may halt
As lamely as their manners."

Muscles of Thigh and Leg.—Turning to the next colored illustration, we have a graphic and faithful view of the deeper muscular arrangements of the thigh and leg, together with a striking description of the nervous supply of the lower extremity. These beautiful, silvery threads are the wires which carry the behests of the will to the muscular levers, and whose commands the muscles promptly obey; and give to the leg its wonderful and diversified endowments. To stand erect is a very difficult and complex act, and the process of walking is a no less difficult or complex function. Few persons ever realize the peril involved in walking, and it has only become safe by constant practice.

Art of Walking.—Walking requires the nicest adjustment, prompt action, and the finest calculations to maintain the dignity, proper attitude, equipoise and balance of the body. This is well illustrated when one runs up against any obstacle in the dark. We observe then with what headlong force the body is propelled forward. In walking the first thing that occurs is the inclining of the body forward; the foot is then gradually raised upon the toes, and brought from a horizontal position into an almost vertical one; at the same time the knee, which was at first considerably bent, straightens out by the advancing forward movement. Every part of the leg and thigh has changed its position except the toes; that part farthest from the toes the most of all; and gradually diminishing in geometrical proportions downward.

How We Walk.—The foot is then raised from the ground and swung forward in true pendulum fashion. The leg in so doing becomes flexed at the knee-joint, and considerably shorter, and the whole weight of the body is transferred to and supported by the leg and foot, which is planted firmly on the ground. The leg and the foot which was swinging in the air is now brought down to the ground, the muscles passing through changes just the reverse of those employed in raising it. Planting this foot firmly on the ground, to prevent the body from falling, we raise the other foot, swing it forward, the leg describing the same movements as before, repeating the process alternately with each leg. These movements constitute the act of walking; the complexity of which is fully iilustrated by the complicated machinery employed for its performance, as we have seen in the beautiful plates showing the wonderful and skilful arrangements of the bones and muscles of the leg.

Grace and Ease in Walking.—In the several beautiful anatomical charts illustrating the bony, muscular and internal mechanism of the human frame we have been consciously awakened to its complexity; we have been forcibly impressed at the amazing skill and wisdom displayed in its marvelous arrangement, and at the general order, system, harmony and perfection which everywhere prevails throughout the diversified contrivance of the body. But its wonders do not stop there. The graceful motion, the ease with which we walk, run, leap, dance, etc., demonstrate with what astonishing rapidity the different muscles concerned in those movements contract and obey the impulse of the will.

The Voice.—The voice may utter one thousand five hundred letters in a minute, yet the articulation of each of those sounds requires a different and distinct position of the vocal organs, the muscles of which move with surprising celerity and swiftness.

Deftness of the Fingers.—In music we train the muscles of the fingers until they glide over the keyboard of the piano with dexterity and precision, and perform the most simple and delightfully exquisite music and on to the grand, difficult and complex passage of operatic harmony. The mind of the skilful and professional violinist is upon the music which his right hand is executing by the varied movements of the bow, yet the muscles of his left hand and fingers are deftly engaged in determining the length of the space on the strings, the character and duration of each note; and so rapidly, carefully, aye, even unconsciously are these complex movements made, that not a false note is heard, though the variation of a single hair's breadth would cause a discord, and thus spoil the pleasing effect of the music, and destroy the attractiveness of its harmony.

Muscle Development.—The bicep muscle in the arm of the blacksmith may grow strong, hard, firm, and as solid almost as a club; the legs of the pedestrian may become large and well developed; the hand of a prize fighter may be trained to strike a stunning blow with the force of a sledge hammer; while the penman can describe the most beautiful curves, the engraver trace lines so delicate and fine as to be invisible to the naked eye, and the fingers of the blind acquire a delicacy of touch that almost compensates for the missing sense. Thus there are few conceptions of the designing mind which the muscular system of man cannot be made to execute and perform.

Book I.

ANATOMY AND PHYSIOLOGY.

Necessity for This Book.—A brief outline of the structure or anatomy, and of the function, use or physiology of the human organism must necessarily inaugurate any book purporting to present the prevention and cure of disease, for disease means disordered function which cannot be understood without some knowledge of the normal or regular function, which in turn necessitates a study of structure.

Plan of the Book.—As anatomy and physiology are naturally inseparable we will interweave one with the other in the following pages, the part played by an organ being given with its description.

Bodily Organs.—Every animal is composed of organs, as the heart, liver, kidney, etc., and every organ consists of tissues, of which there are four varieties: epithelial, connective, nervous and muscular. Each tissue is made of numbers of cells.

Form of Cells.—A cell is a microscopic bag of jelly-like substance called protoplasm, which often contains within its substance a smaller cell called a nucleus, and sometimes inside the smaller cell, a tiny dot called the nucleolus.

Protoplasm.—Protoplasm is formed of water, albuminous substances, sugary material, fat and chemical salts. The chief chemical salts entering into its formation are carbon, hydrogen, oxygen and nitrogen.

Size of Cells.—Cells vary from $\frac{1}{5000}$ to $\frac{1}{120}$ of an inch in diameter; differ in shape; some form layers as in the skin; some bands as in muscle; some tubes as in the hair-like blood-vessels, and some float in fluid as the blood corpuscles. Some have the power of moving from place to place, ameboid motion.

Human Body Compared to a City.—The human body may be compared in its arrangement to a city, the houses being the organs; the brick, stone, wood and metal the tissues, and the individual bricks, fragments of stone, boards or pieces of metal the cells.

Human Body Compared to an Army.—Huxley compares it to an army, "each cell is a soldier, an organ a brigade, the central nervous system the headquarters and field telegraph, and the alimentary and circulatory systems the commissariat." The function of a cell is the same as that of a human being, they absorb food and grow, fill special offices, as protecting, secreting, etc., reproduce and die.

Epithelium.—Epithelial tissue or epithelium means literally upon the nipple. It covers the entire outside of the body, as the skin, the inside of the respiratory, alimentary and genito-urinary apparatuses as mucous membrane, and dips down into the various glands which open on the skin and mucous membrane.

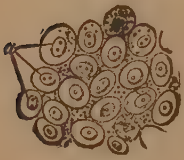


Figure 8.—PAVEMENT EPITHELIUM.

Skin Arrangement.—On the skin it is arranged in layers as pavement epithelium (Fig. 8) and acts as a protection to the delicate structures beneath. In some places, as in the hair and nails, it is much modified to more effectually guard against injury.

Shape in the Stomach.—In the stomach, intestines and elsewhere the epithelial cell is oblong in profile (Fig. 9) and is called columnar epithelium.

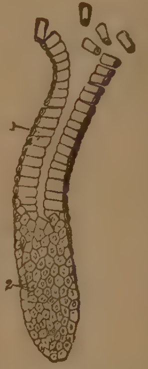


Figure 9.—COLUMNAR EPITHELIUM.

Cilia of Windpipe.—Some epithelium, like that in the windpipe, has projecting from it long waving filaments called cilia (Fig. 10). The cilia wave constantly acting as brooms which keep the windpipe clean.

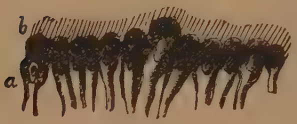


Figure 10.—CILIATED EPITHELIUM.

Glandular Epithelium.—Secretory or glandular epithelium (Figs. 11 and 12) is found in the glands, varies in shape, and

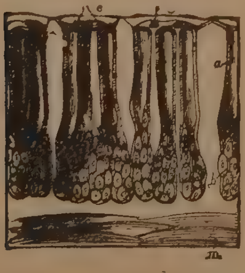


Figure 11.—SIMPLE GLAND.

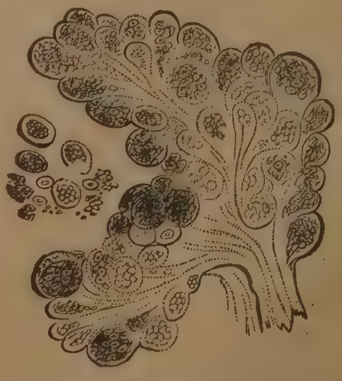


Figure 12.—RACEMOSE GLAND.

is the essential portion of the gland, *i. e.*, the portion which manufactures the special secretion from the blood.

Endothelium.—Endothelium, lining serous sacs, joint cavities (synovial sacs), and the blood and lymphatic vessels, is analogous to epithelium.

Connective Tissue.—Connective tissue occurs as bone, cartilage and fibrous connective tissue.

Bone Structure.—Bone is fibrous tissue cemented with petrified cement. It consists approximately of one-third animal and two-thirds earthy material, the principal earthy constituents being the phosphate and carbonate of lime; lining bone is pinkish in color and oozes blood when cut.

Periosteum.—Externally it is covered by a membrane called periosteum. The shafts of long bones are hollow, the cavity being filled by the marrow which consists of blood and lymph vessels, nerves and fat supported by fibrous tissue.

Tissue of Bones.—Bone tissue is of two kinds, spongy, which forms the very thin bones and the ends of long bones, and compact, which is found in the shafts of long bones and in the outside of flat bones. Spongy bone is made up of a meshwork of bony arches, the spaces filled with vessels, bone cells and connective tissue.

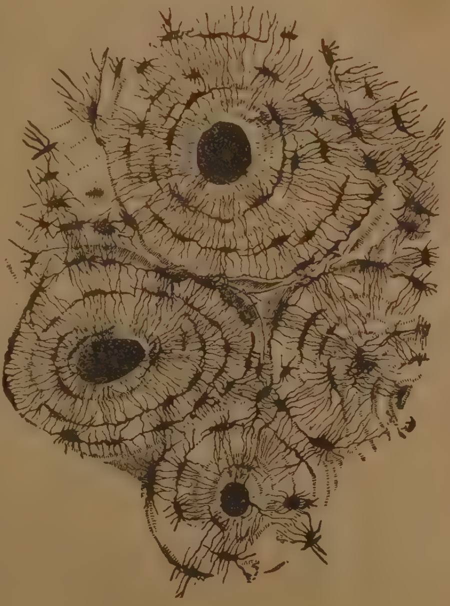


Figure 5.—SECTION OF BONE, MAGNIFIED.

Compact Bone. — Compact bone (Fig. 5) consists of a series of concentric layers of bone disposed around a canal called the Haversian canal which affords passage for the blood-vessels. The layers of bone are separated from each other by small spaces called lacunæ, and passing through the bony layers and connecting the lacunæ are many fine channels called canaliculi; they serve to convey nourishment to the bone cells. The function of bone is to support, to protect, and to give attachment to muscles.

Structure of Gristle.—Cartilage or gristle (Fig. 4) is fibrous tissue glued together by a substance containing chondrine. It has no blood-vessels but is nourished by lymph which filters through it by means of small spaces and canals analogous to the lacunæ and canaliculi of bone.

Use of Gristle.—Cartilage forms a smooth covering for the ends of bones entering into a joint; acts as a buffer between the bones of the spine, prevents certain tubes, like the windpipe, from collapsing, and as in the external ear gathers sound.

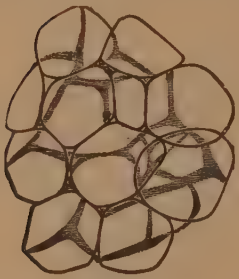


Figure 3.

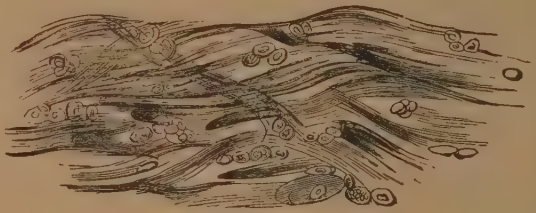


Figure 4.

Figure 3.—FAT.
Figure 4.—CARTILAGE. } Magnified.

Fibrous Tissue.—Fibrous tissue consists ultimately of fibres which are developed from spindle-shaped cells. Its function is to hold the various parts of, and the organs themselves, together. Fatty tissue (Fig. 3) is fibrous connective tissue unfiltrated with fat.

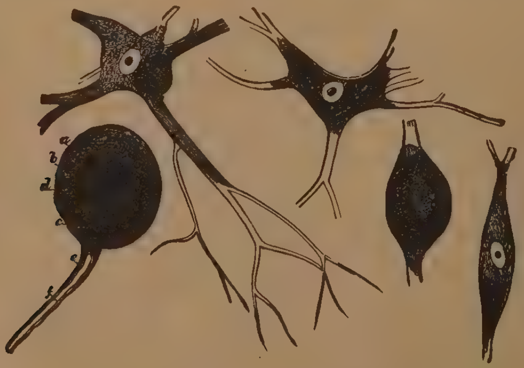


Figure 57.—NERVE CELLS.

Nervous. Tissue.—Nervous tissue is either gray, which is a mass of tailed cells (Fig. 57) supported by a fine connective tissue (neuroglia), or white, which is made of bundles of little nerve febrils, each febril is the tail of a cell in the gray nervous tissue and is surrounded in some places by the white substance of Schwann (Fig. 58) and by a primitive sheath.

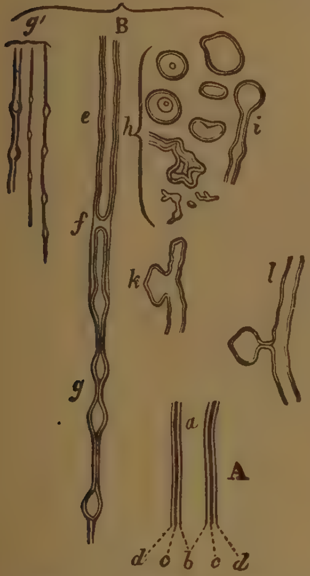


Figure 58.—NERVES. a, axis cylinder; b, inner border of white substance; c, c, outer border of same; d, d, tubular membrane; B, tubular fibres; e, in natural state; f, under pressure; g, varicose fibres.

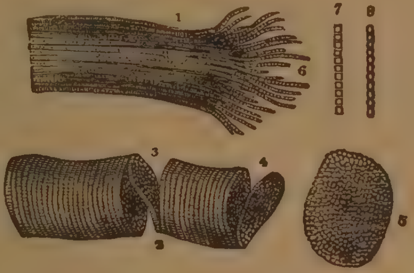


Figure 6.—STRIPED MUSCLE. 1, longitudinal section; 2, 3, 4, cross section; 5, detached disk; 7, 8, fibrillæ.

Muscular Tissue.—There are two kinds of muscular tissue, the voluntary or striped and the involuntary or non-striated. Voluntary muscle (Fig. 6) is composed microscopically of the primitive fasciculi (minute bundles of febrils), each febril of which consists of a row of disks (Fig. 6) called sarcous elements. Involuntary muscle is built of a number of non-striped spindle-shaped cells (Fig. 7) which branch and join with one another.

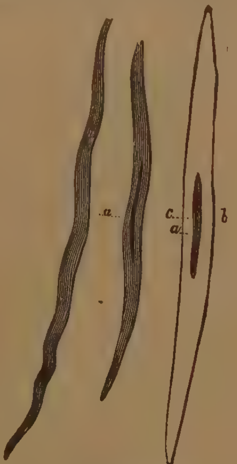


Figure 7.—NON-STRIATED MUSCLE.

THE BONES.

Framework of the Body.—The body skeleton (Fig. 13) forms the framework of the body. Bones are divided into long, short and flat bones. The long bones consist of a hollow shaft of compact bone, and two broader extremities of cancellated bone. They are found in the extremities and form levers by which the trunk is moved.

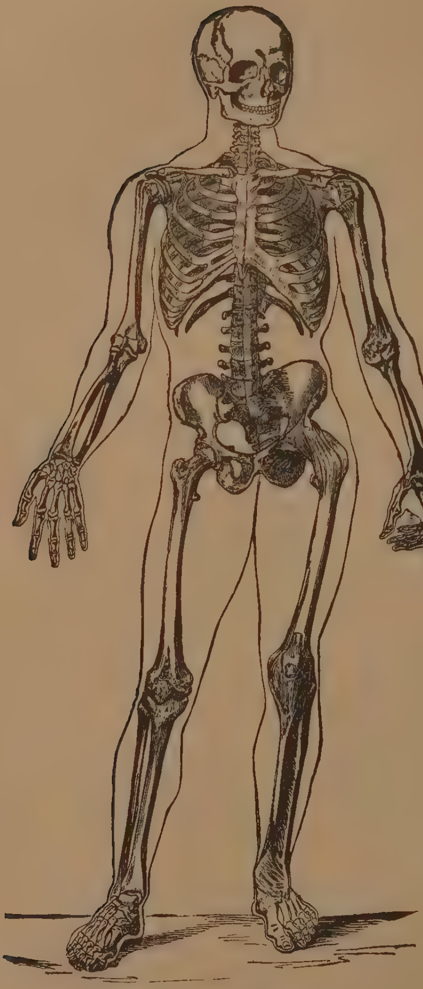


Figure 13.—HUMAN SKELETON.

Short Bones.—Short bones are placed where strength is more necessary than mobility, as in the hand and foot; their structure is spongy, covered by a thin layer of compact bone.

Flat Bones.—The flat bones are found where protection of important organs is necessary, as in the skull, sternum and scapulæ. They consist of two tables of compact bone filled in with cancellous tissue. Certain bones do not belong to one class alone and are called mixed bones.

Number of Bones.—There are in the adult skeleton, excluding the teeth, ossicles of the ear, and Wormian bones, 200 separate bones. These are:

In the spinal column..............	26
In the skull......................	8
In the face.......................	14
Ribs, breast bone and hyoid bone.	26
Upper extremity	64
Lower extremity	62

THE SPINE.

Spinal Column.—The spine (Fig. 14) is a flexible column made of small bones called vertebræ, seven cervical, twelve dorsal, five lumbar, five sacral and four coccygeal vertebæ.

Spinal Vertebræ.—A vertebra (Figs. 16 and 17) consists of a solid portion in front called the body, and an arch behind, so that when placed

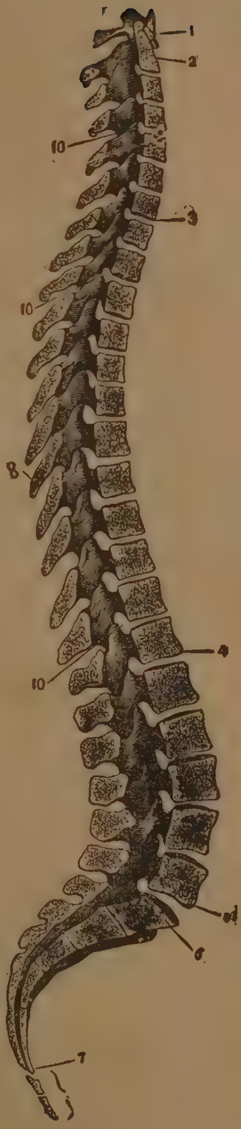


Figure 14.

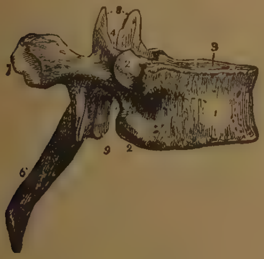


Figure 16

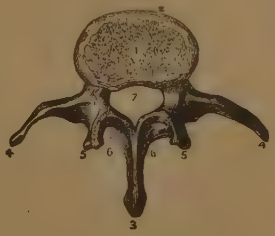


Figure 17.

Figure 14.—SPINAL COLUMN. 1, atlas; 2, axis; 3, vertebra prominens; 4, twelve dorsal; 5, fifth lumbar; 6, 7, sacrum; 8, coccyx; 9, a spinous process; 10, 10, intervertebral foramina.

Figure 16.—DORSAL VERTEBRA. 1, body; 2, facet for rib; 3, superior surface body; 4, 5, intervertebral notch; 6, spinous process; 7, articular facet for tubercle of a rib; 8, 9, articular processes.

Figure 17.—LUMBAR VEREBRA. 1, body; 2, front of the body; 3, spinous process; 4, transverse process; 5, articular process; 6, arch; 7, spinal foramen.

one above the other as in Figure 14, the bodies of the vertebræ form a support for the body and the arches a canal which contains and protects the spinal cord. The arches are formed by a plate of bone on each side (lamina) joined to the body or constructed portion of bone (pedicle) and unite behind to form the spinous process, which is the portion one feels when running a finger down the back.

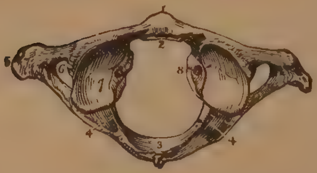


Figure 15.—ATLAS. 1, anterior tubercle; 2, facet for axis; 8, posterior surface spinal canal; 4, 4, intervertebral notch; transverse process; 5, foramen for vertebral artery; 7, superior articular process; 8, tubercle for transverse ligament.

The Atlas.—The first cervical vertebra or atlas (Fig. 15) has neither body nor spinous process, but consists of an anterior and posterior arch and two lateral masses on which rests the skull. The axis, or cervical vertebra has a projection from the upper surface of its body (odontoid process) which fits in the anterior arch of the atlas, permitting the head with the atlas to be rotated from side to side.

The Sacrum.—The sacrum consists of five vertebræ welded into one bone. It is triangular in shape and is wedged in between the haunch bones forming the back of the pelvis. Attached to its apex is the coccyx, which consists of four vertebræ so joined as to form one bone.

Ligaments.—The vertebræ are tied together by ligaments. Between each vertebra and its neighbor is a disk of cartilage which acts as a buffer to prevent shock and allows the spine to bend in various directions.

THE SKULL.

Bones of the Skull.—The skull is divided into the cranium or brain case and the face. The cranial bones are one occipital, two parietal, one frontal, two temporal, one sphenoid and one ethmoid. The occipital bone forms the back and under part of the skull. It is perforated by a large opening (foramen magnum) which transmits the spinal cord to the spinal canal. The cerebellum rests on its inner or upper surface, the external surface give attachment to muscles.

Side and Top Bones.—The parietal bones form the sides and top of the cranium, joining in the median line and being placed between the occipital bone behind and the frontal bone in front.

Frontal Bone.—The frontal bone forms the forehead and forms the roof of the orbit on the upper surface of which rests the brain. The orbital plates are separated by the ethmoid bone, which is spongy and filled with perforations which transmit the nerves of smell to the nose.

Temporal Bone.—The temporal bone consists of a squamous or scale-like portion which overlaps the parietal bone, and a petrous or stony portion which helps form the floor of the cranium. The petrous portion lodges in the internal and middle ear.

Sphenoid Bone.—The sphenoid resembles a butterfly in shape. It is the keystone of cranial achitecture binding the bones of the head firmly together.

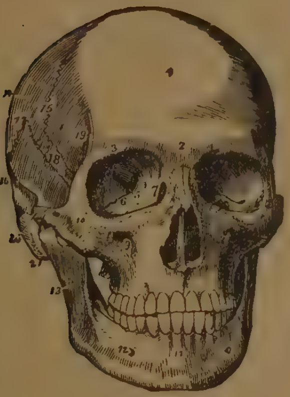


Figure 18.

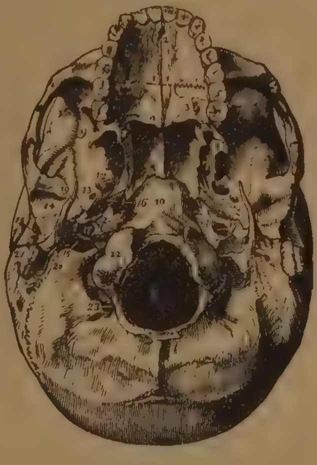


Figure 19.

Figure 18.—FRONT OF THE SKULL. 1, os frontalis; 2, globella; 3, supraorbital ridge; 4, optic foramen; 5, sphenoidal fissure; 6, spheno-maxillary fissure; 7, lacrymal fossa; 8, anterior nares; 9, infra-orbital foramen; 10, malar bone; 11, symphysis menti; 12, anterior mental foramen; 13, ramus of the lower jaw; 14, parietal bone; 15, coronal suture; 16, temporal bone; 17, squamous suture; 18, great wing of the sphenoid.

Figure 19.—BASE OF THE SKULL. 1, hard palate; 2, foramen incisivum; 3, palatine plate of palate bone; 4, crescenteric ridge; 5, vomer; 6, internal pterygoid plate; 7, pterygoid fossa; 8, external pterygoid plate; 9, temporal fossa; 10, basilar process; 11, foramen magnum; 12, foramen ovale; 13, foramen spinale; 14, glenoid fossa; 15, meatus aditorius externus; 16, foramen lacerum anterius; 17, carotid foramen; 18, foramen lacerum posterius; 19, styloid process; 20, stylo-mastoid foramen; 21, mastoid process; 22, condyles of occipital bone; 23, posterior condyloid foramen.

Facial Bones.—The facial bones are: two nasal bones, forming the bridge of the nose; two superior maxillary (upper jaw); two lacrymal, forming a portion of the inner wall of the orbit; two malar or cheek bones; two palate bones forming the back part of the roof of the mouth and the corresponding portion of the floor of the nose; two inferior turbinated bones which are scrolls of bone placed in either nostril; one vomer, forming the partition between the nostrils; and the lower jaw or inferior maxillary bone, horseshoe in shape, joining with the temporal bone above and being freely movable below to permit chewing, talking, etc.

Hyoid Bone.—The hyoid bone is U-shaped, situated in the neck just above the larynx and gives attachment to many muscles of the tongue and throat.

THE THORAX.

The Chest.—The thorax or chest is an elastic bony cage made by the breast bone in front, the spine behind, and the ribs and their cartilages at the sides. It is filled by the heart and lungs, which it protects. The sternum or breast bone occupies the middle line anteriorly, is flat, and is made of three pieces, the manubrium (handle), the gladiolus (blade), and the pointed extremities, the ensiform or xiphoid appendix, these names were given by the ancients who compared it to a sword.

The Ribs.—There are twenty-four ribs (Fig. 20), twelve on each side. They are joined to the vertebra behind and to the sternum, by means of cartilages, in front. They are irregularly semicircular in shape, flattened anteroposteriorly, and slightly twisted on themselves. The head joins the vertebra behind, the neck is the constriction in front of the head and the angle, the point of greatest curvature. The seven upper ribs unite directly with the sternum and are called true ribs. The other five are called false ribs, the upper three being united in front to the cartilages of the ribs above them, and the last two having no attachment in front are termed floating ribs.

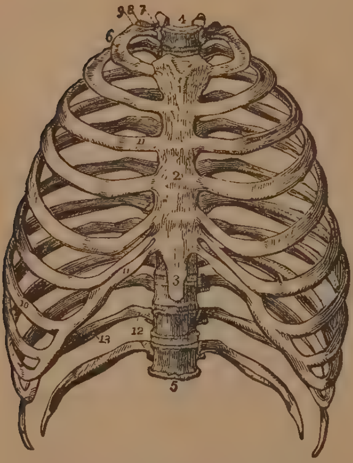


Figure 20.—THORAX. 1, manubrium; 2, gladiolus; 3, ensiform process; 4, first dorsal vertebra; 5, twelfth dorsal vertebra; 6, first rib; 7, its head; 8, its neck; 9, its tubercle. 10, last true rib; 11, its cartilege; 12, angle of eleventh rib; 13, its body.

THE UPPER EXTREMITY.

The Shoulders.—The upper extremity consists of the shoulder, the arm, the forearm, and the hand. The bones of the shoulder are the clavicle and scapula connecting the arm with the trunk. The clavicle, collar, or key-bone is a short bone curved like the letter *f* running horizontally between the sternum and scapula.

The Scapula.—The scapula (Fig. 21) forms the back of the shoulder, is triangular in shape, the apex pointing downward and lies on the ribs. On the upper part of the outer surface is a thick triangular spine, the outer extremity of which (the acromion) forms the point of the shoulder.

Socket of the Shoulder.—Beneath this process the upper angle is hollowed out to relieve the upper end of the arm bone. In front of this depression is a curved prominence, the coracoid process.

Arm Bone.—The humerus (Fig. 22) or arm bone consists of a long cylindrical shaft, having a rounded head above for articulation with the scapula, and a broad flattened lower extremity for articulation with the forearm bones.

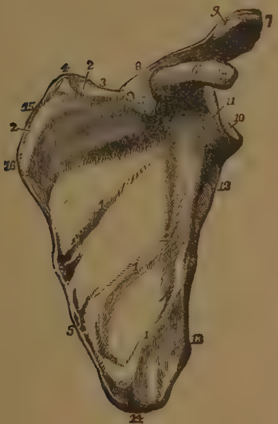


Figure 21.

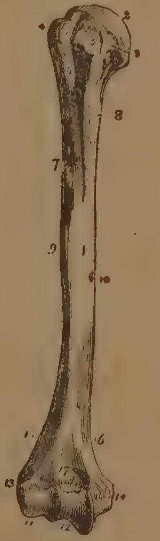


Figure 22.

Figure 21.—SCAPULA. 1, 1, 1, oblique ridges; 2, 2, subscapular fossa; 3, superior border; 4, superior angle; 5, supra-scapular notch; 6, coracoid process; 7, acromion process; 8, spine of scapula; 9, articular surface; 10, glenoid cavity; 11, head of scapula; 12, neck; 13, inferior border; 14, inferior angle; 15, posterior border; 16, origin of the spine.

Figure 22.—HUMERUS. 1, shaft; 2, head; 3, anatomical neck; 4, greater tuberosity; 5, lesser tuberosity; 6, bicipital groove; 7, ridge for pectoralis major; 8, internal bicipital ridge; 9, insertion of deltoid muscle; 10, nutrient foramen; 11, facet for radius; 12, facet for ulna.

The Forearm.—The bones of the forearm are the ulna and the radius. The ulna (Fig. 24) lies on the inner side of the forearm when the palm of the hand faces upward. The upper extremity which joins the humerus, has two processes, the olecranon, forming the point of the elbow and the coronoid process, which complete the hinge joint of the elbow in front.

The lower end of the ulna is small and does not articulate with any bone of the wrist.

The Radius.—The radius (Fig. 23) lies on the outer side of the forearm. It has a cup-shaped head for articulation with the humerus. The rounded edge of the head fits in a concavity of the ulna and is surrounded by a sling-like ligament, which allows the head to rotate. The lower extremity is larger and is hollowed out to fit the wrist bones.

Figure 23.

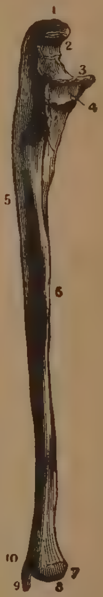


Figure 24.

Figure 23.—RADIUS. 1, head, 2, articulates with ulna; 3, neck; 4, tuberosity; 5, interosseus ridge, 6, articulates with ulna; 7, carpal surface; 8, styloid process; 9, insertion of pronator quadratus.

Figure 24.—ULNA. 1, olecranon; 2, sigmoid cavity; 3, coronoid process; 4, lesser sigmoid cavity; 5, external surface; 6, interosseus ridge; 7, articulates with radius; 8, carpal surface.

The Wrist.—The wrist or carpus consists of eight small bones in two rows (Fig. 25). In the upper row, beginning at the radial side, are the scaphoid, semilunar, cuneiform, and pisiform bones; in the lower row, the trapezium, trapezoid, or magnum and unciform bones.

The Hand.—The hand is made of five short cylindrical bones called the metacarpal bones (Fig. 25), to the lower extremity of which are attached the finger bones or phalanges, there being two for the thumb and three for each finger.

THE LOWER EXTREMITY.

Parts of Lower Extremity.—The lower extremity consists of three parts, the thigh, the leg and the foot, and is united to the trunk by the os innominatum or haunch bone, which bears the same relation to the lower extremity that the bones of the shoulder do to the upper extremity.

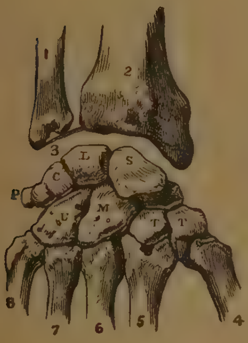


Figure 25.—CARPUS. 1, ulna; 2, radius; 3, interarticular cartilage; 4, metacarpal of thumb; 5, 6, 7, 8, metacarpal bones of fingers; S, scaphoid; L, semilunar; C, cuneiform; P, pisiform; T, T, trapezium and trapezoid; M, magnum; U, unciform.

The os innominatum (Fig. 26) consists of the ilium, ischium and pubes, which in the adult grow together and form one single bone. It is irregularly oblong in shape and twisted upon itself. The ilium is the broad upper part of the bone and forms the prominence of the hip. The ischium is the V-shaped lower portion upon which we sit. The pubes is situated in front and is also V-shaped; in the adult the upper part is covered by hair. Between these V-shaped bones is a large opening, the obturator or thyroid foramen.

Hip Socket.—At the junction of the three bones is a cup-shaped cavity, the acetabulum or socket of the hip, which receives the rounded head of the thigh bone. In front the pubic bones join and behind the sacrum complete the bony ring of the pelvis. The pelvis (Fig. 26) is basin-shaped, supports the contents of the abdomen and the trunk upon the limbs.

Thigh Bone.—The femur (Fig. 27) or thigh bone is the largest and strongest bone in the body. It consists of a shaft and two extremities. The upper extremity consists of a head which is spherical and smooth, fitting into the acetabulum, and a neck which joins the shaft at an obtuse angle. The shaft supports the body, is an important lever in locomotion and gives attachment to muscles. The lower extremity resembles the lower end of the humerus; it is smooth and joins with the main bone of the leg, the tibia.

Knee Pan.—The patella or knee pan is a small flat bone situated in the huge tendon of the great muscles on the front of the thigh. It protects the knee joint and increases the leverage.

Leg Bones.—The leg bones are the tibia or shin bone (Fig. 27a) and the fibula (Fig. 28). The tibia, the larger and stronger, is expanded above to join the femur; the shaft is triangular, the sharp edge in front may be readily felt beneath the skin as the shin. The lower extremity forms the inner part of the ankle joint. The fibula (Fig. 28) is a long, slender bone lying on the outside of the leg. Its upper end joins the expanded upper extremity of the tibia, strengthening it, the lower end forms the outer part of the ankle joint.

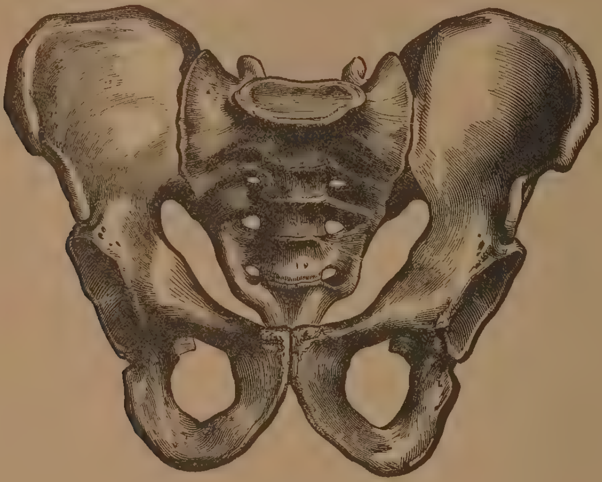


Figure 26.

Figure 26.—MALE PELVIS.

Foot Bones.—The foot (Fig. 29) consists of the tarsus or ankle bones, the metatarsus or foot bones and the phalanges or toe bones. The bones of the tarsus are the calcaneum, os calcis, or heel bone, the astragulus which joins the bones of the leg, the cuboid, the scaphoid and the three cuneiform bones. There are five metatarsal bones corresponding to the metacarpal bones of the hand. The phalanges are similar to those of the hand, there being two for the great toe and three for each of the other toes.

THE JOINTS.

Where two bones meet a joint or articulation exists. The bones may be so soldered together (Fig. 30) as to form an immovable joint, as in the bones of the skull; they may be slightly movable as the pelvic and vertebral joints, or they may be freely movable as in most of the articulations of the limbs. The freely movable joints (Fig. 31) are the hinges, as the elbow, the ball and socket, as the shoulder, the gliding, as the sterno, clavicular articulation, and the ring and pivot (Fig. 32) joint, as the atloaxoid articulation. The structures entering into joint formation are bones, cartilages, ligaments and synovial membrane which secretes the lubricating fluid of the joint. (Figs. 30, 31 and 32.)

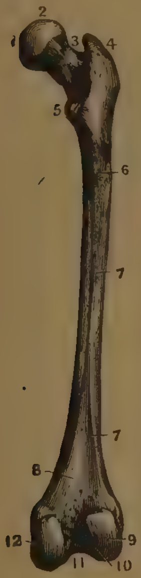


Figure 27.

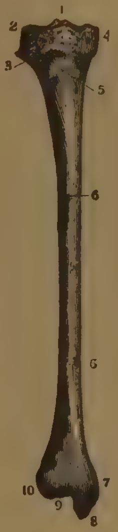


Figure 27a.

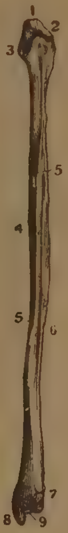


Figure 28.

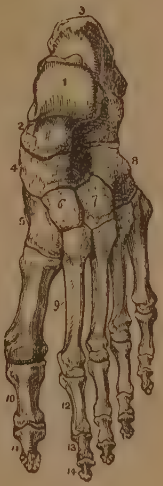


Figure 29.

Figure 27.—FEMUR. 1, depression for round ligament; 2, head; 3, depression for rotary muscles; 4, great trochanter; 5, lesser trochanter; 6, roughness for gluteus maximus; 7, linea aspera; 8, gastrocnemius insertion; 9, external condyle; 10, depression for anterior crucial ligament; 11, depression for posterior crucial ligament; 12, origin of internal lateral ligament.

Figure 27a.—TIBIA. 1, spine; 2, articulates with femur; 3, facet for fibula; 4, head; 5, tubercle; 6, 6, shaft; 7, internal malleolus; 8, attaches internal lateral ligament of ankle; 9, tarsal surface; 10, facet for fibula.

Figure 28.—FIBULA. 1, head; 2, articular facet; 3, insertion of external ligament; 4, shaft; 5, 5, external face; 6, interosseus ridge; 7, facet for tibia; 8, external malleolus; 9, tarsal surface.

Figure 29.—FOOT BONES. 1, astragalus; 2, its anterior face; 3, os calcis; 4, scaphoid; 5, internal cuneiform; 6, middle cuneiform; 7, external cuneiform; 8, cuboid; 9, 9, metatarsal bones; 10, first phalanx of big toe; 11, second phalanx; 12, 13, 14, phalanges of other toes.

It will be unnecessary to describe the individual joints, reference having already been made to them in the section on bones.

THE MUSCLES.

Function of Muscles.—Muscles are familiar as the flesh of animals. They are attached to bones, ligaments, cartilages and the skin, and by their contractions cause all the movements of the body. Some muscles are arranged in sheets (Fig. 33), some are spindle-shaped, some are disposed

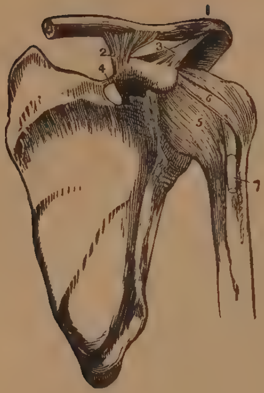


Figure 30.

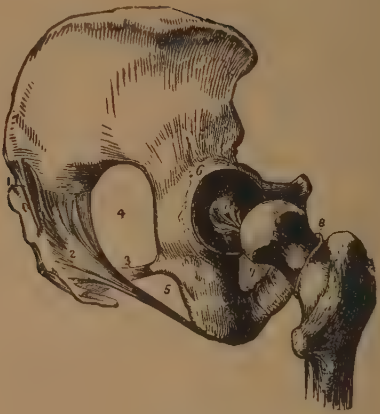


Figure 31.

Figure 30.—ACROMIO-CLAVICULAR and SHOULDER JOINTS. 1, upper acromio-clavicular ligament; 2, coraco-clavicular ligament; 3, coraco-acromial ligament; 4, coracoid ligament; 5, capsular ligament of shoulder; 6, coraco-humeral ligament; 7, long head of biceps.

Figure 31.—HIP JOINT. 1, posterior sacro-iliac ligament; 2, greater sacro-sciatic ligament; 3, lesser sacro-sciatic ligament; 4, great sciatic notch; 5, lesser sciatic notch; 6, cotyloid ligament; 7, ligamentum teres; 8, attachment for capsular ligament; 9, obturator ligament.

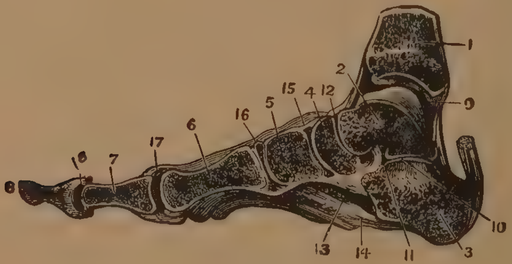


Figure 32.

Figure 32.—SECTION OF ANKLE JOINT. 1, tibia; 2, astragalus; 3, os calcis; 4, scaphoid; 5, internal cuneiform; 6, metatarsal of big toe; 7, 8, first and second phalanges of great toe; 9, articular cavity between tibia and astragalus; 10, synovial capsule between astragalus and ascalcis; 11, calcaneo-astragaloid ligament; 12, synovial capsule between astragalus and scaphoid; 13, calcaneo-scaphoid ligament; 14, calcaneo-cuboid ligament; 15, synovial capsule between scaphoid and internal cuneiform; 16, synovial capsule between internal cuneiform and first metatarsal; 17, metatarso-phalangeal articulation of great toe; 18, phalangeal articulation of great toe.

in rings like the muscle which closes the mouth, and in some the fibres spread out like a fan.

Muscle Attachments.—They are attached by fibrous cords, the tendons, or by broad fibrous bands, the aponeuroses. The end of the muscle which has the firmer attachment is called its origin (Fig. 34), the other end its insertion; this is, as a rule, merely relative, as in most cases the muscles act from either extremity; for instance, the sterno-cleido mastoid, the muscle which forms the prominent cord at either side of the neck, has its

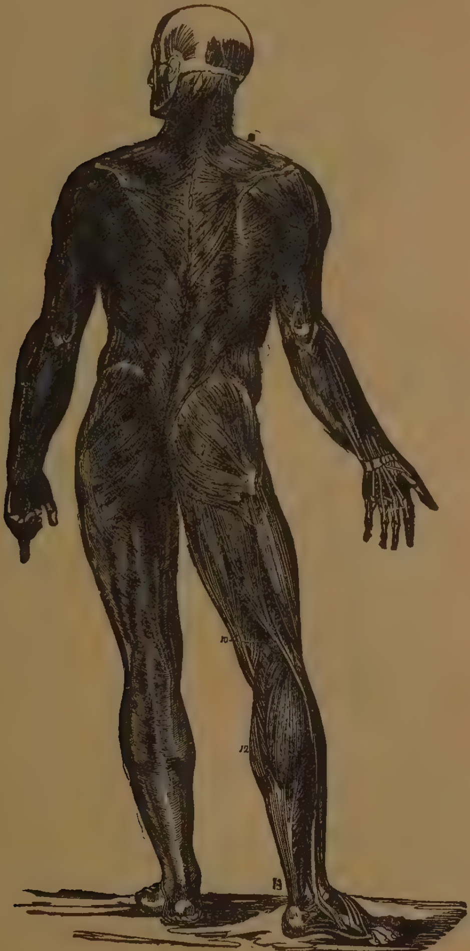


Figure 33.

Figure 33.—MUSCLES, BACK VIEW. The fascia is left upon the left limbs; removed from the right.

origin from the top of the breast bone and the end of the collar bone, and its insertion into the bony prominence of the skull behind the ear, its action is to bow the head and turn the face to the opposite side; but if the head be fixed it serves to raise the ribs and is thus an accessory muscle of respiration.

Face Muscles.—Of the numerous small muscles of the face (Fig. 35), it is not necessary to speak here; as a rule they arise from the bones of the face and are inserted into the skin, by their mobility giving expression to the countenance.

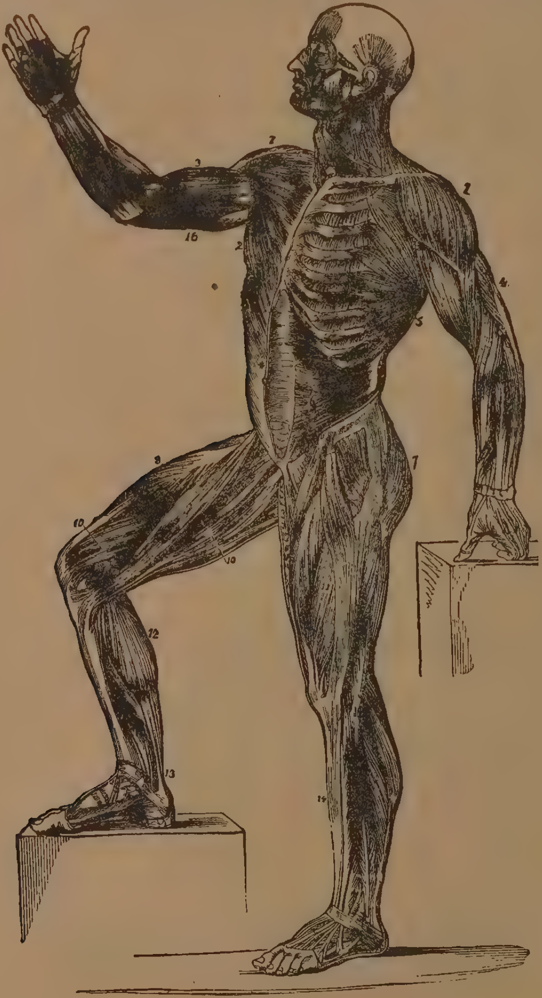


Figure 34.

Figure 34.—MUSCLES, FRONT VIEW. On the right half, superficial muscles; left half, deep muscles.

Muscles of Chewing.—The muscles of the orbit will be taken up in connection with the eye. The muscles of mastication are the temporal, masseter, the two pterygoids and the buccinator. The temporal arises from the side of the head above the ear and is inserted into the top of the lower jaw. The masseter runs from the bony process external to the orbit, to the angle of the jaw and forms the hard mass felt in the cheek when the jaw is tightly closed.

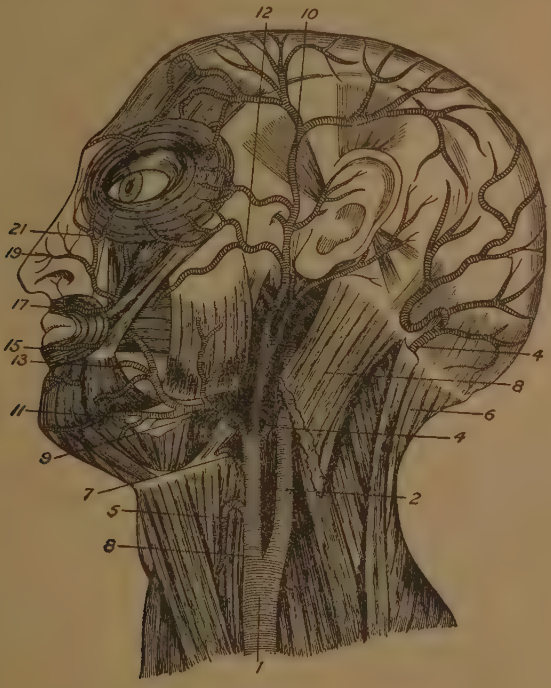


Figure 35.

Figure 35.—MUSCLES OF FACE, JAW AND NECK. 1, longus colli; 2, trapezius; 3, sterno-hyoid; 4, sterno-mastoid; 5, crico-thyroid; 6, trapezius; 7, constrictor of pharynx; 8, sterno-mastoid; 9, digastric; 10, attrahens aurem; 11, mylo-hyoid; 12, masseter; 13, depressor of lower lip; 15, orbicularis oris; 17, levator of upper lip; 19, levator of angle of mouth; 21, orbicularis palpebrarum.

Muscles of the Jaw.—The pterygoids run from the base of the skull to the lower jaw, moving it laterally. The buccinator is a broad, flat sheet in the cheek compressing the cheeks as when blowing or whistling, etc.

The sterno-cleido mastoid has already been mentioned above. The muscles of the larynx will be spoken of in connection with diseases of the throat.

Muscles of the Back.—The most important muscles of the back are the trapezius, which pulls the head back or the shoulder upward or backward and which runs from the occipital bone and the spine as far as the middle of the back, to the shoulder bones; the latissimus dorsi, which draws the arm downward and backward, and which arises from the lower ribs, the lower half of the spine and the haunch bone and is inserted into the arm bone near its head; and the erector spinæ which arises from the pelvis and lumbar vertebræ and is inserted into all the vertebræ above; it maintains the spine erect.

Muscles of Thorax.—Concerning the thorax we may mention the intercostal (between the ribs) muscles, external and internal, the external set raising the ribs and the internal set depressing the ribs in respiration.

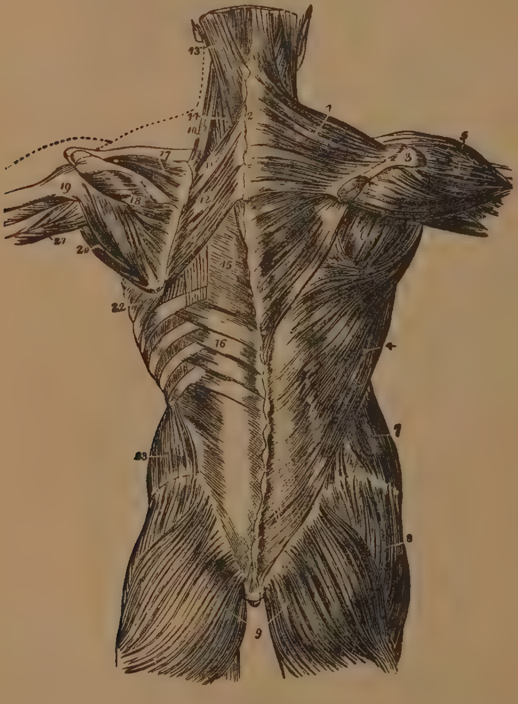


Figure 36.

Figure 36.—MUSCLES OF BACK. 1, trapezius; 2, its origin; 3, spine of scapula; 4, latissimus dorsi; 5, deltoid; 6, infra-spinatus; 7, external oblique; 8, gluteus medius; 9, gluteus maximus; 10, levator scapulæ; 11, rhomboideus minor; 12, rhomboideus major; 13, splenius capitus; 14, splenius colli; 15, origin latissimus dorsi; 16, serratus inferior posticus; 17, supra-spinatus; 18, infra-spinatus; 19, teres minor; 20, teres major; 21, long head triceps; 22, serratus major anticus; 23, internal oblique.

The Diaphragm.—The diaphragm is a musculo-fibrous partition forming the dome of the adbomen and separating it from the thorax. It is attached to the lower ribs and spinal column and is perforated by the aorta, inferior vena cava and gullet. It is a muscle of respiration and expulsion.

The Abdomen.—The abdomen is completed in front and at the sides by a thick wall of muscle which not only aid in protecting the underlying structures but assist in expelling the urine, feces, etc., from the body. This wall is made of the external oblique muscle which runs from the ribs downward and inward to the pelvic bones and linea alba—the linea alba or white line occupies the midline of the abdomen and is formed by the union of the various muscular structures of the abdominal wall; the internal oblique muscle arises from the ilium and lower fibrous part of the external oblique (Poupart's ligament), runs upward and inward to be inserted into the linea alba and lower ribs; the transversalis which runs transversely between the brain, spine, ribs and pelvis to the linea alba, and the rectus abdominalis which is situated near the middle line of the body and runs from the ribs to the pelvis.

Breast Muscles.—The pectoralis major and minor muscles form the fleshy masses of the breast. They run from the collar-bone, breast-bone and ribs to the caracoid process of the scapula and the humerus, the fibres converging from their origins to their insertions. They draw the shoulder forward and the arm across the chest.

Deltoid Muscle.—The deltoid (Fig. 37) forms the prominence of the shoulder. It arises from the clavicle and scapula, the fibres converging to be inserted into the humerus just above the middle. It raises the arm from the side.

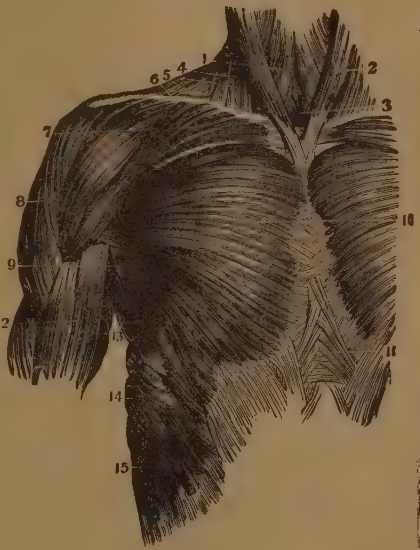


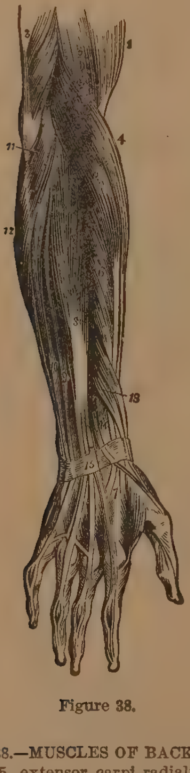
Figure 37.

Figure 37.—CHEST MUSCLES. 1, sterno-hyoid; 2, sterno-mastoid; 3, sterno-thyroid; 4, sterno-mastoid; 5, trapezius; 6, clavicle; 7, origin pectoralis major; 8, deltoid; 9, lower edge pectoralis major; 10, middle pectoralis major; 11, fibres external oblique; 12, biceps; 13, teres major; 14, serratus major anticus; 15, external oblique interlocking with serratus major.

The Biceps.—The biceps forms the prominence on the front of the arm when the forearm is flexed. It arises from the scapula by two heads and is inserted into the upper end of the radius. It flexes the forearm and assists in supinating or turning it over.

The Triceps.—The triceps arises from the shoulder blade and the back of the humerus by three heads, and is inserted into the upper end of the ulna. It extends the forearm.

Muscles of Forearm.—The muscles of the forearm are very numerous, and give the forearm and hand a multitude of movements. The muscles which turn the palm downward are called pronators, the most important of these is the pronator radii teres which runs from the inner part of the lower end of the humerus to the radius. The most important supinator



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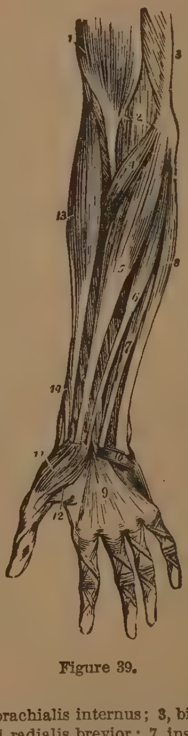


Figure 39.

Figure 38.—MUSCLES OF BACK FOREARM. 1, biceps; 2, brachialis internus; 3, biceps; 4, supinator longus; 5, extensor carpi radialis longior; 6, extensor carpi radialis brevior; 7, insertion of these muscles; 8, extensor communis digitorum; 9, extensor communis digitorum; 10, extensor carpi ulnaris; 11, anconeus; 12, flexor carpi ulnaris; 13, extensor minor pollicis; 14, extensor major pollicis; 15, posterior annular ligament.

Figure 39.—MUSCLES OF FRONT FOREARM. 1, biceps; 2, brachialis internus; 3, triceps; 4, pronator radii teres; 5, flexor carpi radialis; 6, palmaris longus; 7, flexor sublimus digitorum; 8, flexor carpi ulnaris; 9, palmar fascia; 10, palmaris brevis; 11, abductor pollicis; 12, flexor brevis pollicis; 13, supinator longus; 14, extensor ossis metacarpi pollicis.

or muscle which turns the palm upward (Fig. 38), is the supinator longus which runs from the outer part of the lower end of the humerus to the lower end of the radius.

Flexors.—The radial and ulnar flexors (of the wrist) come from the inner part of the arm bone and are inserted into the hand bones. Beneath these muscles lies the flexor sublimus digitorum which divides into four tendons or leaders, one for each finger. These leaders are split so as to give passage to the leaders of the flexor profundus digitorum which are inserted into the ends of the fingers. The thumb is moved by special muscles.

Radial Extensors.—The muscles on the back of the forearm are the longer and shorter radial extensors (of the wrist), which lie behind the long supinator and whose tendons are inserted respectively into the metacarpal bones of the first and second fingers. The ulnar extensor of the wrist lies on the ulnar side of the forearm, and is inserted into the metacarpal bone of the little finger. Between these muscles, in the middle of the forearm (Fig. 39) is the common extensor of the fingers which is inserted by four tendons into the backs of the last two bones of the fingers. The index and little fingers have special extensors. The hand is supplied by a number of short muscles which give it marvelous dexterity.

MUSCLES OF THE LOWER EXTREMITY.

The muscles of the lower extremity consist of those of the hip, thigh, leg and foot. The psoas magnus and the iliacus, the former from the lumbar vertebræ, the latter from the inside of the ilium, are inserted together into the upper part of the femur. They flex the thigh and roll it outward. The buttocks are composed of the three glutei muscles. They arise from the pelvic bones and are inserted into the upper part of the femur. They extend the hips, raise the body from the stooping posture, and hold the trunk on the thigh bones. Partly beneath them lies a group of muscles (Fig. 41), the rotators of the hip; they are the pyriformis, gemelli, the internal and external obturators, and the quadratus femoris.

Thigh Muscles.—The rectus femoris with the vastus externus and internus form the mass of muscle on the front of the thigh. The rectus arises from the ilium, the vastus from the femur; they join to form a common tendon which is attached to the upper end of the tibia. They extend the leg, flex the thigh, and raise the body from the sitting to the standing posture.

The Tailor's Muscle.—The sartorius, the longest muscle in the body, runs from the ilium downward and inward across the thigh to the inner side of the shin bone below the knee. It flexes the thigh and crosses the legs.

The biceps femoris arises from the ischium and is inserted into the head of the fibula (Fig. 40). The semimembranosus and the semitendinosus take origin from the ischium and are inserted into the inner part of the head of the tibia. They extend the hips, flex the knee, and raise the body from the stooping position.

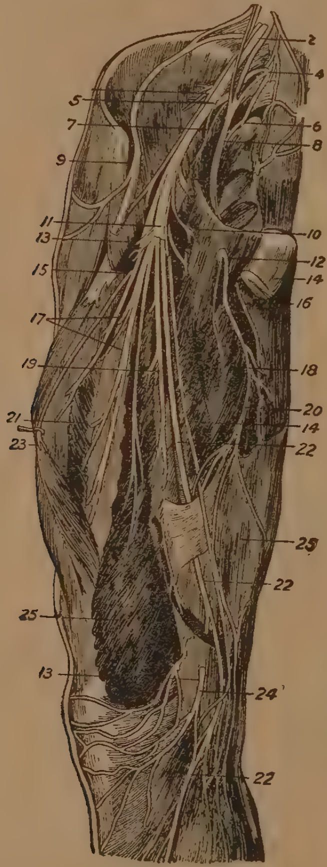
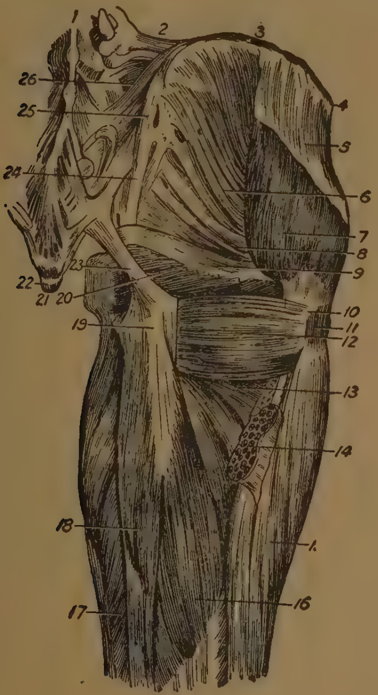


Figure 40.

Figure 40.—NERVES OF THIGH. 1, sympathetic ganglia; 2, third lumbar; 3, branches to iliacus; 4, fourth lumbar; 5, anterior crural; 6, lumbo-sacral; 7, branch to the psoas; 8, obturator; 9, external cutaneous; 10, nerve to pectineus; 11, branch anterior crural; 1, superficial division of obturator; 13, sartorius muscles; 14, adductor longus; 15, branch to rectus; 16, deep division of obturator; 17, branches to vastus externus and crureus; 18, adductor brevis; 19, branch to vastus internus; 20, adductor magnus; 21, vastus externus; 22, internal saphena; 23, rectus femoris; 24, patellar branch of saphena; 25, vastus internus; 26, gracilis.

Muscles of the Calf.—The calf of the leg is made of the soleus arising from the upper back part of the bones of the leg, and the gastrocnemius, arising from the lower end of the femur; they unite in a common tendon of great size, tendo-achillis which is attached to the back of the heel bone. They extend the foot and raise the weight of the body in walking and running. Beneath them lie the popliteus and the flexors of the toes corresponding to the flexors of the fingers in the forearm. The extensor longus digitorum is attached to the leg bones and to the second and third phalanges (Fig. 42) of the four lesser toes by four tendons. The great



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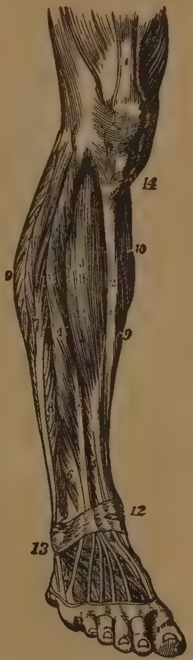


Figure 42.

Figure 41.—MUSCLES BACK OF THIGH. 1, fifth lumbar vertebra; 2, ilio-lumbar ligament; 3, crest of ilium; 4, anterior superior spinous process; 5, origin of fascia femoris; 6, gluteus medino; 7, its lower and anterior portion; 8, pyriformis; 9, gemini; 10, trochanter major; 11, insertion gluteus medius; 12, quadratus femoris; 13, adductor magnus; 14, insertion gluteus maximus; 15, vastus extensus; 16, long head biceps; 17, semimembranous; 18, semitendinosus; 19, tuber ischii; 20, obturator internus; 21, point of coccyx; 22, posterior coccygeal ligament; 23, 24, great sacro-sciatic ligament; 25, posterior superior spinous process; 26, posterior sacro-iliac ligaments.

Figure 42.—MUSCLES FRONT OF LEG. 1, tendon of quadriceps; 2, spine tibia, 3, tibialis anticus; 4, extensor communis digitorum; 5, extensor proprius pollicis; 6, peroneus tertius; 7, peroneus longus; 8, peroneus brevis; 9, soleus; 10, gastrocnemius; 11, extensor brevis digitorum.

toe has two special flexors and a special extensor and the little toe a special flexor.

On the back of the foot is one muscle only, the extensor brevis digitorum which assists the long extensor of the toes.

Sole of the Foot.—The sole of the foot, like the palm of the hand, is covered by a dense fibrous sheath, the plantar fascia, running from the heel bone to the metatarsal bones in front; it sustains the arch of the foot, and protects the vessels and nerves beneath. Immediately beneath it lies the flexor brevis digitorum, arising from the heel bone and being inserted into the sides of the second bones of the lesser toes by four tendons which are perforated by the long flexor tendons; and just below this is the flexor accessorius which is attached to and aids the tendon of the long flexor. There are numerous other small muscles in the foot which give it complicated movements.

THE DIGESTIVE APPARATUS.

What it Consists of.—The digestive apparatus consists of the alimentary or food canal (Fig. 72) which extends from the mouth to the anus and is between twenty and thirty feet in length, and of the various glands which open into it. The alimentary canal is divided into the mouth, pharynx, esophagus, stomach, small intestine and large intestine. Its function is to digest or convert the food into an assimilable form.

The Mouth.—The mouth is an oval cavity containing the tongue and teeth. In it the food is ground up and mixed with saliva (Fig. 68), which

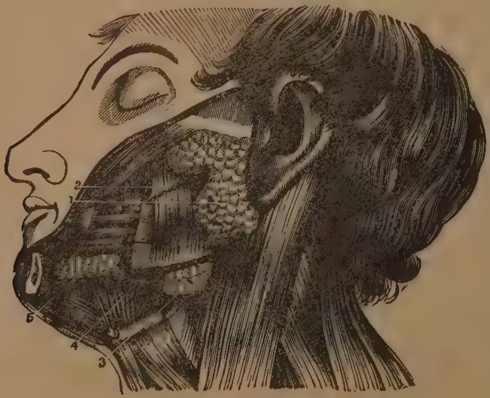


Figure 68.

Figure 68.—SALIVARY GLANDS. 1, carotid; 2, Steno's duct; 3, submaxillary; 4, its duct; 5, sublingual.

not only moistens it so that it may be readily swallowed but acts on the starchy foods changing them to sugar. The teeth are described in the chapter on teeth. The saliva is secreted by the parotid gland below and in front of the ear, and by the submaxillary and sublingual glands which lie in the floor of the mouth.

The Tongue.—The tongue (Fig. 69) is a muscle covered by mucous membrane, containing many mucous glands and little projections called papillæ in which are lodged the ends of the taste nerves. The tongue is the organ of taste, assists in articulation, and aids in mixing the saliva with food and keeping the food between the teeth.

The Pharynx.—The pharynx is really the upper part of the esophagus, expanded into a muscular bag. It hangs from the skull above, is four and a half inches long, and communicates with the nose, ear, mouth, esophagus and larynx.

The Gullet.—The esophagus or gullet is nine inches long, of same construction as the pharynx, and empties into the stomach. After the food is chewed it is forced into the pharynx which contracts and pushes it down into the esophagus, which propels it onward to the stomach. During swallowing the opening into the larynx is closed by a little trap door called the epiglottis.

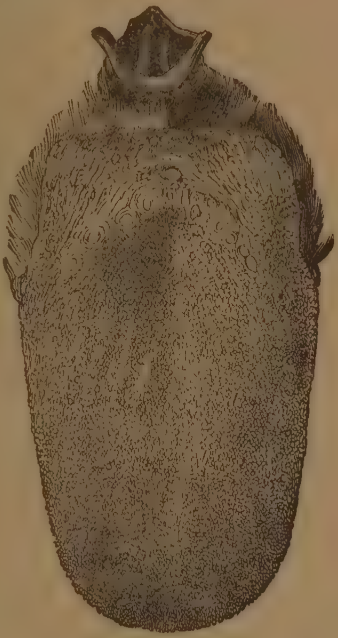


Figure 69.

Figure 69.—TONGUE. a, circumvallate papillæ; b, fungiform papillæ; d, conical papillæ; e, glottis and epiglottis.

The Stomach.—The stomach (Fig. 70) is roughly pear-shaped; the big end, lying on the left side, measures twelve inches transversely and four inches vertically, is situated just below the diaphragm, receives the esophagus in its upper left wall (cardiac opening), and empties into the small intestine at the extreme right (pylorus), the opening being guarded by a circular valve reinforced by muscular fibres.

The Stomach Walls.—The stomach wall is made of four layers: externally the peritoneum prevents friction; next is the muscular coat which churns the food, then the cellular coat which carries the blood-vessels, and internally is the mucous membrane (tripe of cow) containing thousands of little glands (Fig. 71), the peptic or gastric glands, which secrete the gastric juice. When food reaches the stomach, the cardiac orifice and pylorus close, the stomach contracts and mixes it with the gastric juice which is now freely secreted.

The Gastric Juice.—Gastric juice is made of water, salts, hydrochloric acid and pepsin. It changes albumen to peptone, which is readily absorbed, dissolves the cellulose of vegetable and the fibrous tissue of meats. Water and some of the peptones are absorbed by the stomach. The remaining portion of the food, now a liquid, passes on into the intestines.

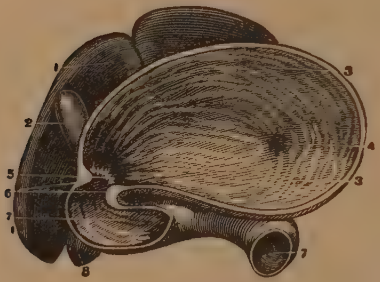


Figure 70.

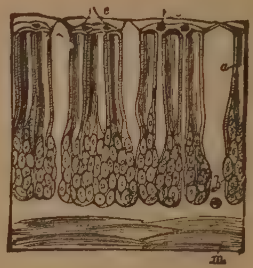


Figure 71.

Figure 70.—STOMACH.
Figure 71.—STOMACH TUBULE. a, neck; b, fundus; c, orifice; m, muscular coat.

Small Intestine.—The small intestine is about twenty feet in length, one inch in diameter, and extends from the stomach to the cecum, into which it empties. It is connected to the spine by a fold of peritoneum, the mesentery, and is contained in the lower and central portion of the abdomen. It is divided, beginning above, into the duodenum, jejunum and ileum.

Duodenum.—Into the duodenum empty the ducts of the liver and pancreas. The small intestine has four coats similar to those of the stomach. In the small intestine the albumens are changed to peptones, fat emulsified, and starches converted into sugars by the action of the bile from the liver, the pancreatic juice and the intestinal juices. The peptones, fat and sugar are absorbed by the intestinal walls and the remaining portion of the food passes into the large intestine which also absorbs to a slight extent the nutritious portions of its contents, which are now senusated and are called feces.

Large Intestine.—The large intestine is five feet in length, runs from an enlarged pouch, the cecum, into which the small intestine empties, to the anus. It is about three times as large in calibre as the small intestine. The cecum is situated in the right lower corner of the abdomen, ending below in the vermiform appendix which varies from three to six inches in length and is about one-quarter inch in diameter. In the cecum the large intestine ascends to the liver (ascending colon), passes over to the

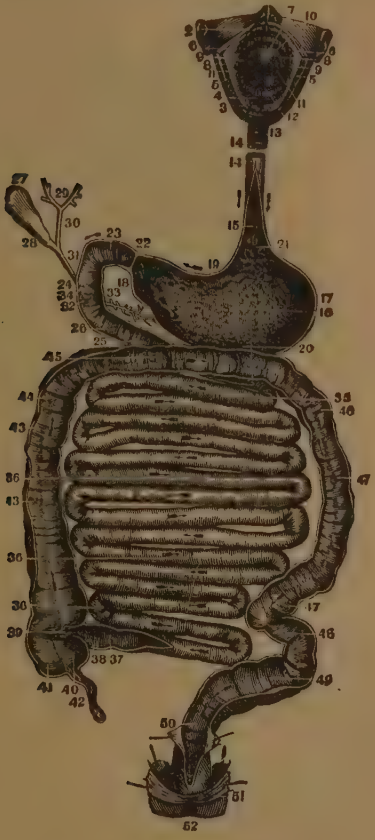


Figure 72.

Figure 72.—ALIMENTARY CANAL. 1, 3, lips; 2, 4, frænum; 5, cheek; 6, Steno's duct; 7, roof of mouth; 8, half arches; 9, tonsils; 10, velum; 11, tongue; 12, papillæ; 13, trachea; 14, esophagus; 15, its interior; 16, stomach; 17, its greater end; 18, its lesser end; 19, lesser curvature; 20, greater curvature; 21, cardiac orifice; 22, pylorus; 23, 24, 25, duodenum; 26, valvulæ conniventes; 27, gall bladder; 28, cystic duct; 29, 30, hepatic duct; 31, common bile duct; 32, its opening; 33, 35, jejunum; 34, opening of pancreatic duct; 36, 38, ileum; 37, v. conniventes; 39, ileo-cecal valve; 40, 41, cecum; 42, appendix vermiformis; 43-48, colon; 49, 50, rectum; 51, levator ani; 52, anus.

spleen on the left side (transverse colon), descends on the left side (descending colon) to the pelvis where it curls like an S (sigmoid flexure) and then ends in the rectum which reaches the surface of the body as the anus. As the feces accumulate in the large intestine they are forced downward to the sigmoid flexure and rectum where they remain until expelled from the body.

The Sweetbread.—The pancreas (sweetbread) is a long narrow gland about seven inches in length lying behind the stomach. Its duct opens in common with the bile duct, into the duodenum.

The Liver.—The liver (Fig. 74), the largest gland in the body, weighs about four pounds, and is situated in the upper right corner of the abdomen, where it is retained by the peritoneum which, after forming its outer coat, runs to the abdominal walls as ligaments. It is divided into five lobes, which are made up of lobules, each about one-twentieth of an inch in diameter, between which the vessels and ducts ramify. The bile duct has appended to it a pear shaped bag, the gall bladder, which, lying on the under surface of the liver, acts as a reservoir for the bile during the intervals of digestion. The bile duct unites with the pancreatic duct and empties into the

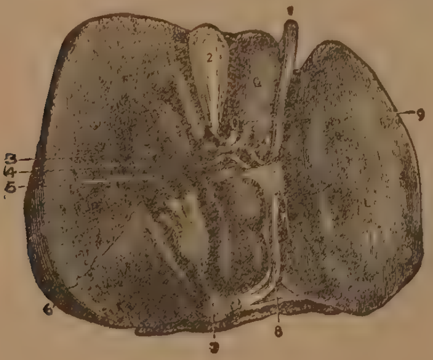


Figure 74.

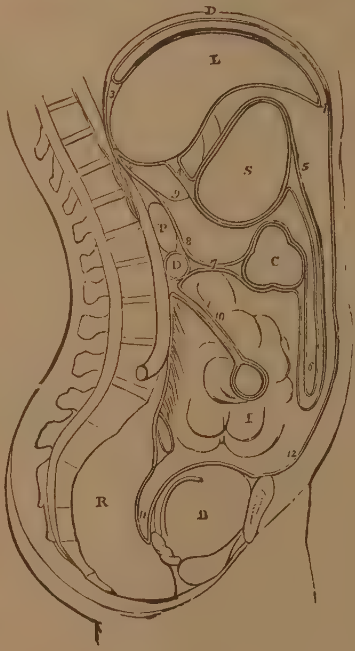


Figure 75.

Figure 74.—LIVER. R, right lobe; L, left lobe; Q, quadrate lobe; S, lobus Spigelli; C, lobus caudatus; 1, umbilical vein; 2, gall bladder; 3, hepatic artery; 4, hepatic duct; 5, portal vein; 6, reflexion of peritoneum; 7, vena cava; 8, ductus venosus; 9, common bile duct.

Figure 75.—PERITONEUM. D, diaphragm; L, liver; S, stomach; C, transverse colon; D, transverse duodenum; P, pancreas; I, small intestine; R, rectum; B, bladder.

duodenum. The liver secretes bile, stores up sugar from the blood, helps make blood, destroys poison in the blood and excretes urea and allied products.

Peritoneum.—The peritoneum (Fig. 75) covers all the abdominal organs; it is a serous sac containing a small quantity of fluid which prevents friction between the organs it covers. The omentum is a double fold of peritoneum, which falls from the front of the stomach nearly to the bladder, then ascends to the transverse colon.

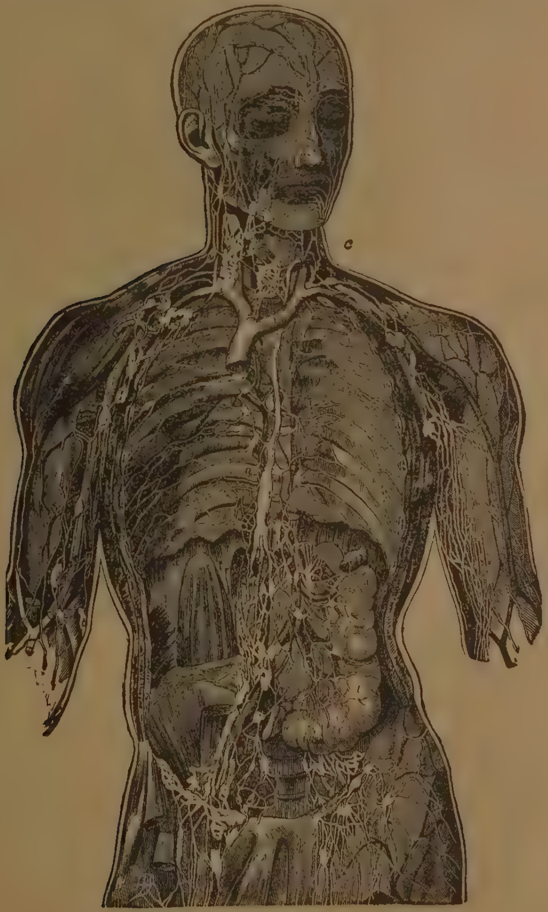


Figure 73.

Figure 73.—LYMPHATICS. a, receptaculum chyli; c, thoracic duct; v, innomonate vein.

Absorption.—Absorption means the passage of materials from mucous surfaces, serous cavities or tissues into the lymph or blood-vessels.

The Lacteals.—The digested fat in the intestines is absorbed by lymph vessels, called lacteals, because their contents resemble milk. These lacteals converge from various parts of the intestine to form the thoracic duct which passes up and empties into a large vein in the neck. The dilated lower end of the thoracic duct is called the receptaculum chyli. The lymph from the tissue all over the body is collected into the lymphatic vessels (Fig. 56) which, finally by two big trunks, the thoracic duct and the right thoracic duct, into the veins of the neck. On its way to the blood the lymph passes through the lymph glands which frequently swell when any poison passes through them, the kernels felt in the neck during an attack of tonsilitis for example.

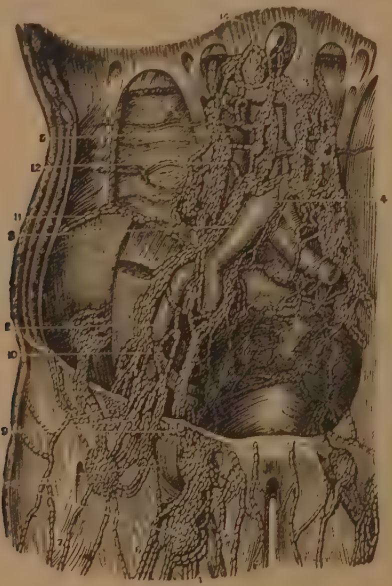


Figure 56.

Figure 56.—LYMPHATICS. 1, saphenous vein; 2, external iliac; 3, common iliac; 4, aorta; 5, ascending vena cava; 6, 7, lymphatics; 8, lower set of inguinal glands; 9, superior set of inguinal glands; 10, chain of lymphatics; 11, lymphatics with circumflex iliac vessels; 12, lumbar and aortic lymphatics; 13, origin thoracic duct; 14, thoracic duct.

BLOOD—CIRCULATORY SYSTEM.

Composition of Blood.—The blood is made from the food we eat, and it in turn feeds all the tissues of the body and drains away all their waste products. It consists of liquor sanguinis (liquid of blood) and corpuscles (little bodies), the former containing water, proteids, salts, nutritive and excrementitious matter. The corpuscles (Fig. 54) are red, which are $\frac{1}{3200}$ of an inch in diameter, circular and biconcave, or white, which exist in the proportion of one to three or four hundred reds, are $\frac{1}{2500}$ inch in diameter and possess amœboid motion. When blood is exposed to air it clots, a stringy material proteid in nature, fibrin, which exists in solution in the liquor sanguinis, entangles the corpuscles forming a semisolid mass.

Function of Corpuscles.—Blood corpuscles carry oxygen from the lungs to the tissues and the liquor sanguinis carries food; the blood drains carbon dioxide and other waste products from the tissues to the excretory organs: skin, kidney, liver and lungs.

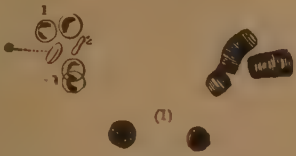


Figure 54.—BLOOD CORPUSCLES.

Circulatory Apparatus.—The blood is carried to and from the tissues by the circulatory apparatus which consists of the heart, arteries, capillaries and veins. The heart pumps the blood through the arteries to the thin-walled capillaries where the food passes out to the tissues and waste is given to the blood; from the capillaries the blood drains into the veins which run to the heart. The heart then sends the blood to the lungs to be purified, to the intestines for food and again pumps it out to the tissues.

The Heart.—The heart is a hollow muscular organ of conical form, placed in the chest between the lungs and inclosed in a serous sac, the pericardium. It is placed obliquely; the base, to which is attached the great vessels, is directed upward and backward; the apex is directed downward and to the left, and corresponds to the interval between the fifth and sixth ribs, one inch to the inner side and two inches below the nipple.

In a grown person (Fig. 51) the heart is about five inches in length, three and a half inches in breadth at its broadest part and two and a half inches thick. In the male it weighs from ten to twelve ounces and in the female about two ounces less.

Heart Divisions.—The heart is divided longitudinally by a muscular partition into two halves and a transverse partition divides these halves into two cavities. The lower cavities are called ventricles and the upper ones auricles. The walls of the auricles are thinner than those of the ventricles and the walls of the right side of the heart are thinner than those of the left.

Right Auricle.—The right auricle receives the blood from the two main veins of the body—the two vena cavæ. From the auricle the blood is forced into the right ventricle through the auriculo-ventricular orifice. This opening is guarded by the tricuspid valve, to prevent the reflux of blood into the auricle when the ventricle contracts. This valve is composed of three segments, to the free margin of which are attached tendinous cords, which, springing from the muscular ridges projecting from the inner surface of the ventricle, the columnæ carneæ, give support to the valves.

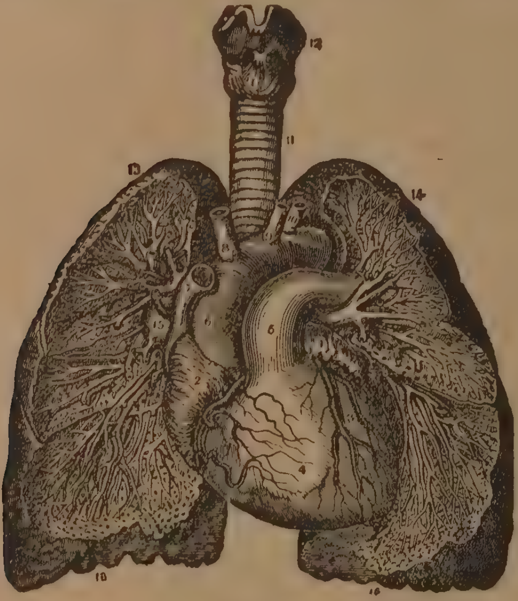


Figure 51.

Figure 51.—HEART and LUNGS. 1, left auricle; 2, right auricle; 3, left ventricle; 4, right ventricle; 5, pulmonary artery; 6, arch of aorta; 7, superior vena cava; 8, innominate artery; 9, common carotid; 10, subclavian; 11, trachea; 12, larynx; 13, upper lobe right lung; 14, upper lobe left lung; 15, right pulmonary artery; 16, lower lobes of lungs.

Right Ventricle.—The walls of the right ventricle (Fig. 52) are about one-third as thick as those of the left ventricle. Beside the opening into the auricle there is the opening into the pulmonary artery which is guarded by the semilunar valves, three semicircular folds of the lining membrane of the heart.

Course of the Blood.—The blood is forced from the right ventricle through the pulmonary artery to the lungs, the semilunar valves closing after each contraction of the ventricle so preventing any backward flow.

Left Auricle.—The left auricle is smaller than the right, but thicker; it receives the blood which returns from the lungs by the pulmonary veins and forces it into the left ventricle through an opening, guarded by valves, similar to the right auriculo-ventricular orifice, except that the valve, called the mitral valve, has but two segments.

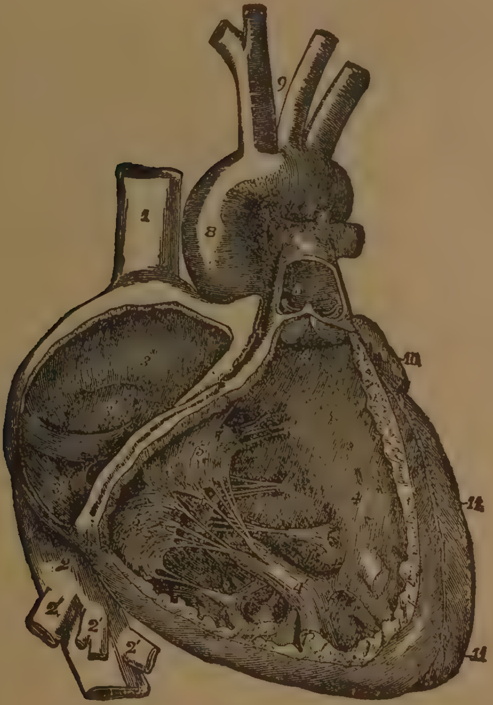


Figure 52.

Figure 52.—HEART. 1, superior vena cava; 2, inferior vena cava; 2', hepatic veins; 3, right auricle; 3', fossa ovalis; 3'', aperture coronary vein; +, +, in auriculo-ventricular groove; 4, 4, cavity right ventricle; 4', columnæ carnæ; 5, 5', 5'', tricuspid valve; 6, pulmonary artery; 7, concavity aortic arch; 8, ascending aorta; 9, between innominate and left carotid; 10, auricular appendage; 11, 11, left ventricle.

Left Ventricle.—The left ventricle is the thickest and strongest portion of the heart. The blood received by it through the auriculo-ventricular orifice is discharged into the main artery of the body, the aorta, through an opening which is guarded by semilunar valves (Fig. 53) as in the case of the pulmonary artery. The cavities of the heart are lined by a delicate endothelium, which is continuous with that of the blood-vessels.

Pulsation.—The heart pulsates from seventy-five to eighty times per minute in the adult; in childhood it is more rapid. The strength and rapidity are governed by the nerves which supply the heart with force.

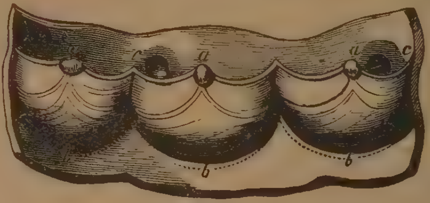


Figure 53.—SEMILUNAR VALVES.

Heart Sound.—Upon listening to the heart two sounds are heard. The first sound, dull and heavy, is caused by the contraction of the heart, the shutting of the auriculo-ventricular valves and the rush of blood. The second sound, sharp in character, is due to the snapping shut of the semilunar valves.

ARTERIES.

Function of Arteries.—The arteries carry the blood from the heart to all parts of the body. It has three coats, an outer areolar elastic coat, a middle muscular coat and an inner endothelial coat.

The Aorta.—The main artery of the body is called the aorta (Fig. 43). It springs from the left ventricle, runs up toward the neck, then turns and descends along the spine and divides in the lower abdomen into the two common iliac arteries.

Coronary Arteries.—Just after leaving the heart it sends the two coronary arteries to the heart muscle. Then as it arches through the chest it gives off on the right side the innaminate artery and on the left side the left common carotid and the left subclavian arteries. The innominate divides into the right common carotid and subclavian arteries.

Cardiacs.—The carotids (Fig. 44) run up the neck to the top of the larynx where they divide into the external carotid which supplies the outside of the head and the internal carotid which supplies the brain, ear and eye.

Subclavian.—The subclavian (Fig. 45) supplies the chest, neck and upper extremity; when it reaches the armpit it is called the axillary artery and in the arm it is called the brachial. This trunk, called subclavian axillary and brachial, according to its situation, gives off numerous branches to the various structures of the shoulder and arm. At the elbow it divides into the radial and ulnar branches. The brachial lies on the inner, protected side of the arm just beneath the biceps muscle. It is important to know its location when making pressure to stop hemorrhage lower down the arm.

Radial Artery.—The radial artery (Fig. 46) from the bend of the elbow down the radial side of the arm to the wrist, where it is frequently felt to determine the character of the pulse; it then winds around the base of the thumb, enters the palm between the thumb and metacarpal bone of the index finger and forms an arch (deep palmar arch), which sends branch to the thumb, index finger and palm.

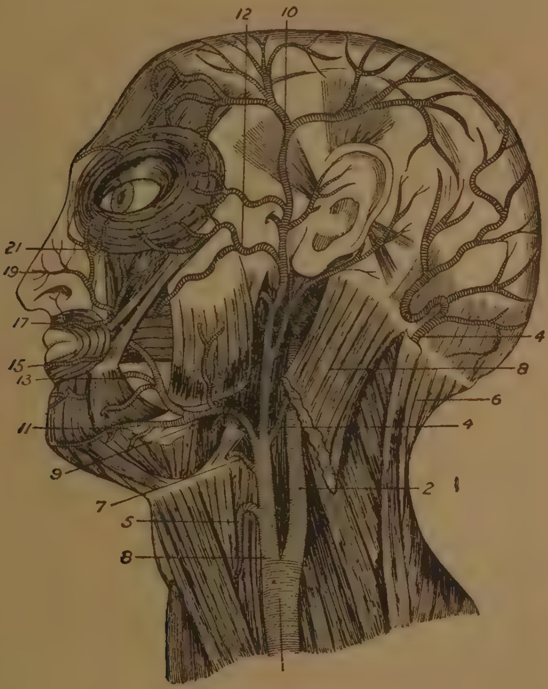


Figure 43.

Figure 43.—ARTERIES OF HEAD. 1, common carotid; 2, internal carotid; 3, external carotid; 4, occipital; 5, superior thyroid; 6, trapezius; 7, lingual; 8, sterno-mastoid; 9, facial; 10, temporal; 11, submental; 12, transverse facial; 13, inferior labial; 15, inferior coronary; 17, superior coronary; 19, lateral nasal; 21, angular.

Ulnar Artery.—The ulnar artery, larger than the radial, passes down the inner side of the forearm, giving off branches to the muscles. In the palm it also describes an arch (superficial palmar arch) which sends branches to the fingers.

Thoracic Aorta.—The portion of the aorta in the thorax is called the thoracic aorta, that in the abdomen the abdominal aorta. The thoracic aorta supplies the pericardium, lungs, esophagus and intercostal structures with nourishment.

Abdominal Aorta.—The abdominal aorta (Fig. 47) supplies the diaphragm, stomach, liver, spleen, intestines, kidneys, ovary or testicle and muscles of the abdominal wall by branches whose names correspond to the organ it supplies.

Common Iliacs.—Opposite the fourth lumbar vertebræ the aorta divides into the two common iliacs, short trunks which again divide into the internal and external iliac arteries, giving off no branches.

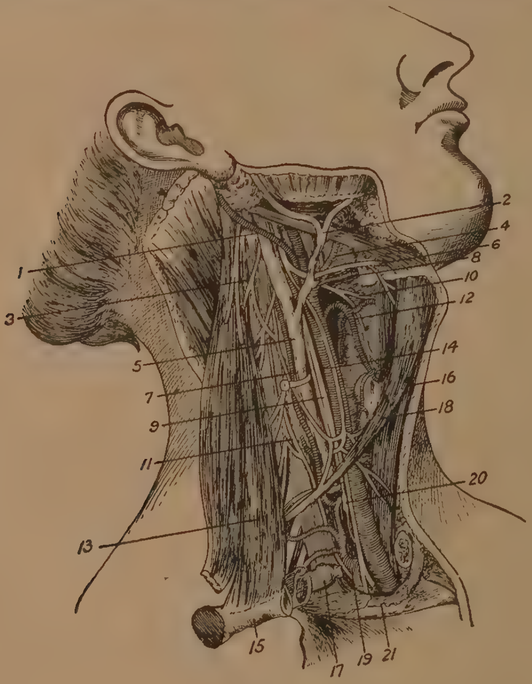


Figure 44.

Figure 44.—ARTERIES OF NECK. 1, occipital artery; 2, facial vein; 3, spinal accessory nerve; 4, facial artery; 5, internal jugular vein; 6, hypoglossal nerve; 7, communicans noni nerve; 8, lingual artery; 9, pneumogastric; 10, superior larnygeal nerve; 11. phrenio; 12, superior thyroid artery; 13, sterno-mastoid; 14, common carotid; 15, clavicle; 16, sterno-hyoid; 17, subclavian; 18, omo-hyoid; 19, subclavian; 20, sympathetic ganglia; 21, apex lung.

The internal iliac dips into the pelvic cavity and divides into two trunks; the anterior gives off branches to the bladder, rectum, anus, genital organs, buttocks and upper part of the thigh; the posterior trunk sends branches to the buttocks, sacrum and muscles in the pelvis.

External Iliac.—The external iliac (Fig. 48) runs across the pelvis and escaping below Poupart's ligament is continued down the thigh as

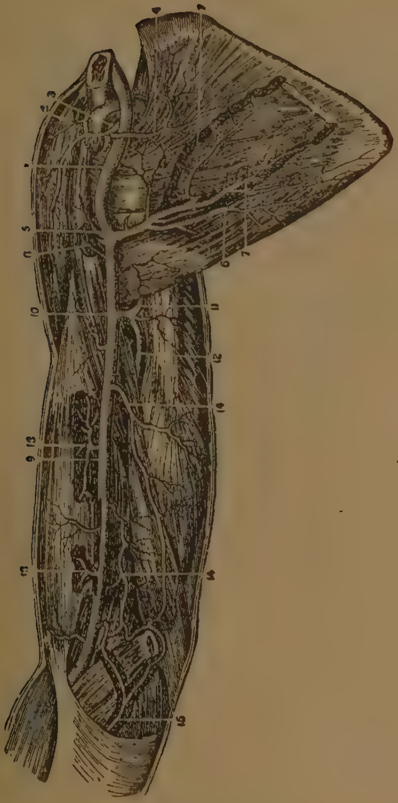


Figure 45.

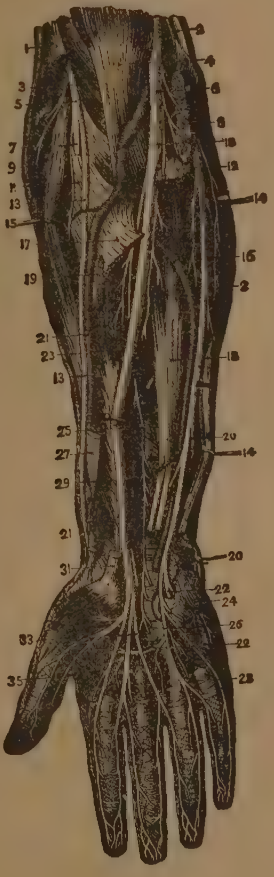


Figure 46.

Figure 45.—ARTERIES OF ARM. 1, axillary artery; 2, thoracica acromialis; 3, superior thoracic; 4, subscapular; 5, inferior scapular; 6, 7, branches to the teres and subscapularis; 8, anterior circumflex; 9, brachial; 10, profunda; 11, posterior circumflex; 12, profunda; 13, muscular branches; 14, branches to brachialis internus; 15, recurrent ulnar.

Figure 46.—DEEP DISSECTION FRONT OF FOREARM. 1, supinator longus; 2, ulnar nerve; 3, brachialis anticus; 4, biceps; 5, musculo-spiral; 6, median nerve; 7, posterior interosseous nerve; 8, pronator teres and flexor carpi radialis; 9, extensor carpi radialis longior; 10, brachial artery; 11, supinator brevis; 12, flexor sublimus digitorum; 13, 13, radial nerve; 14, flexor carpi ulnaris; 15, extensor carpi radialis brevior; 16, ulnar artery; 17, radial origin of flexor sublimus digitorum; 18, flexor profundus digitorum; 19, pronator teres; 20, dorsal branch ulnar nerve; 21, radial artery; 22, deep branch ulnar nerve; 23, flexor longus pollicis; 24, abductor minimi digiti; 25, anterior interosseous nerve; 26, digital branches of ulnar nerve; 27, supinator longus; 28, one of lumbricales; 29, pronator quadratus; 31, flexor carpi radialis; 33, digital branches median nerve; 35, abductor pollicis.

the femoral artery. It gives off two large branches to the muscles of the belly.

Femoral Artery.—The femoral artery runs a straight course down the thigh from the middle of the groin to the lower third of the femur, where

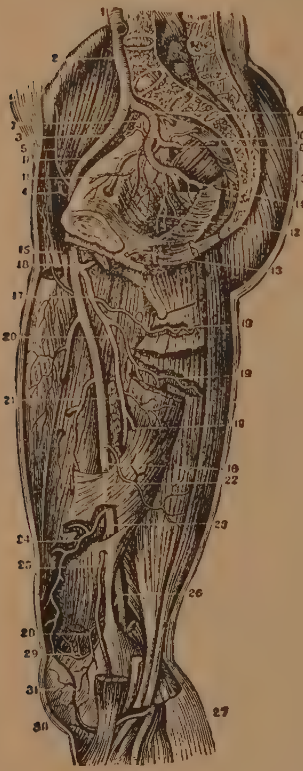


Figure 47.

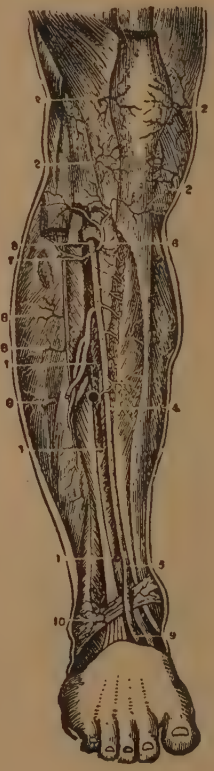


Figure 48.

Figure 47.—ARTERIES OF THIGH. 1, aorta; 2, common iliac; 3, external iliac; 4, epigastric; 5, circumflex iliac; 6, internal iliac; 7, ilio-lumbar; 8, gluteal; 9, obturator; 10, lateral sacral; 11, vesical arteries; 12, middle hemorrhoidal; 13, internal pudic; 14, ischiatic; 15, femoral; 16, foramen for femoral; 17, profunda; 18, internal circumflex.

Figure 48.—ARTERIES OF LEG. 1, extensor proprius pollicis; 2, articular arteries; 3, anterior tibia; 4, 5, same artery; 6, recurrent branch; 7, 8, muscular branches; 9, dorsalis pedis; 10, external malleolar artery.

it passes through an opening in the muscles and becomes the popliteal. After giving off several small vessels to the muscles of the thigh it sends out a large trunk, the profunda, which gives off two, the circumflex and three perforating branches, which supply the muscles.

Popliteal Artery.—The popliteal is the continuation of the femoral running in the hollow behind the knee joint, dividing just below the knee joint into the anterior and posterior tibial arteries.

Anterior Tibial.—The anterior tibial passes forward between the bones of the leg at its upper part, passes down the front of the leg, and, on the front of the foot, becomes the dorsalis pedis.

Dorsalis Pedis.—The dorsalis pedis runs along the back of the foot and terminates in the artery of the great toe; it gives off branches to the tarsus and metatarsus, the latter forming an arch and giving branches to the toes.

Posterior Tibial.—The posterior tibial descends along the inside of the back of the leg to the hollow behind the inner ankle, where it divides into the two plantar arteries. It gives branches to the muscles of the leg, tibia and ankle.

Plantars.—The internal and external plantar arteries crossing the foot form an arch, from which branches are given to the toes, in a manner analogous to those in the hand.

Pulmonary Artery.—From the right ventricle of the heart arises the pulmonary artery, which conveys the impure blood to the lungs to be purified.

THE VEINS.

Vein Function.—After the blood flows through the capillaries it is collected by the veins, which are made by small branches joining to form larger branches and these again joining larger trunks, and so on.

Vein Structure.—The veins have three coats, like the arteries, but are thinner, less elastic, and when empty collapse. They have valves at intervals to prevent the backward flow of blood.

Jugular Vein.—The small veins of the exterior of the head follow the arteries and have similar names. They empty into the external jugular which runs down the neck and empties into the subclavian vein.

Internal Jugular.—The internal jugular receives the veins from the interior of the cranium, passes down the neck with the carotid artery and unites with the subclavian vein to form the innominate vein.

Innominate Veins.—The two innominate veins are in the chest and join to become the superior vena cava.

Veins of Upper Extremity.—The veins of the upper extremity (Fig. 49) besides those accompanying are a radial, an anterior and posterior ulnar and a median vein. They collect the blood from the hand and forearm, and just above the bend of the elbow the ulnar veins unite to form the basilic vein, which passes up the inner side of the arm and empties into the axillary vein.

Radial Vein.—The radial vein forms the cephalic, which passes up the outside of the arm and winding around the shoulder-joint empties into the axillary vein.

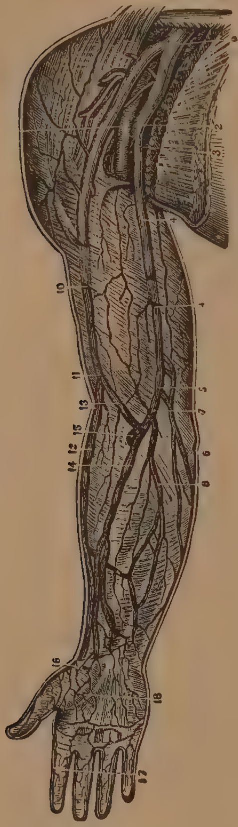


Figure 49.

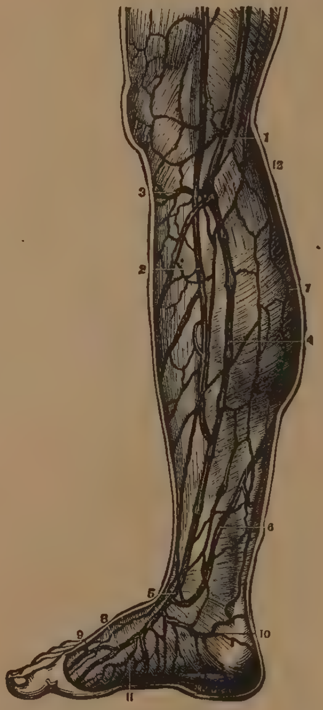


Figure 50.

Figure 49.—VEINS OF UPPER EXTREMITY. 1, axillary artery; 2, axillary veins; 3, 4, basilic; 5, point where median basilic joins basilic; 6, posterior basilic vein; 8, anterior basilic vein; 9, point where cephalic enters axillary; 10, portion same vein; 11, point where median cephalic enters cephalic; 12, lower portion cephalic vein; 13, median cephalic vein; 14, median vein; 15, anastomosing branch; 16, cephalica-pollicis veins; 17, veins of fingers; 18, palmar veins.

Figure 50—VEINS OF LEG. 1, saphenous; 2, collateral branch; 3, anastomosis; 4, internal saphenous; 5, origin of saphenous; 6, anastomosing branch; 7, branches on back leg; 8, internal vein of foot; 9, arch veins on metatarsal bones; 10, branch from heel; 11, branches on sole of foot.

Median Vein.—Below the bend of the elbow the median and a branch from the deep veins empty into a large V-shaped vein; running from its apex into which these veins empty it unites together the basilic and cephalic veins, one arm being called the median basilic and the other the median cephalic.

Axillary Vein.—The axillary vein, in the armpit, runs up to form the subclavian which joins the internal jugular to form the innominate.

The internal saphenous vein (Fig. 50) commences on the back of the foot, and running straight up the inner side of the leg and thigh joins the femoral vein just below Poupart's ligament.

Saphenous Vein.—The external or short saphenous vein begins at the outer side of the foot, runs up the middle of the calf of the leg and empties into the popliteal vein.

The deep veins follow the arteries and have similar names.

Femoral Vein.—The femoral vein receives all the veinous blood from the leg, runs with the femoral artery into the abdomen, becomes the external iliac which joins with the internal iliac to form the common iliac. The two common iliacs join to form the inferior vena cava which runs up the spine and empties into the right auricle, receiving in its course the various abdominal veins.

Portal Vein.—The veins from the stomach, spleen and intestines are collected into a short trunk, the portal vein, which enters the liver. The blood from the liver is collected by the hepatic vein which empties into the inferior vena cava.

Pulmonary Veins.—The four pulmonary veins start as capillaries in the walls of the air cells of the lungs, carry pure blood and empty into the right auricle.

RESPIRATORY APPARATUS.

In order to reach the lungs air passes through the nose, pharynx, larynx and trachea, which warm it and filter it of impurities.

The Larynx.—The larynx (Adam's apple) is the organ (Fig. 55) of voice, and will be described in connection with disease of the throat.

Windpipe.—The trachea (windpipe) is made of rings of cartilage, joined by connective tissue. It is five inches long and lies just beneath the skin of the neck until it enters the chest where it divides into the two bronchial tubes, one going to each lung. These divide and subdivide into numerous branches.

The Lungs.—The lungs are conical, slate colored in adult life and are separated in the middle of the thorax by the heart, gullet and great blood-vessels. The outer surface of the lungs is convex and smooth, the inner surface concave. Above it extends into the neck, below it rests upon the diaphragm. The right lung is the larger and is divided into three lobes, the left into two.

Lung Lobes.—Each lobe is made of little lobules which consist of a little ramification of a bronchial tube communicating with air cells.

Lung Membrane.—The surface of the lung is covered by a smooth serous membrane, the pleura, which is reflected upon the walls of the chest; the intervening space contains a small quantity of fluid which prevents friction during the respiratory movements.

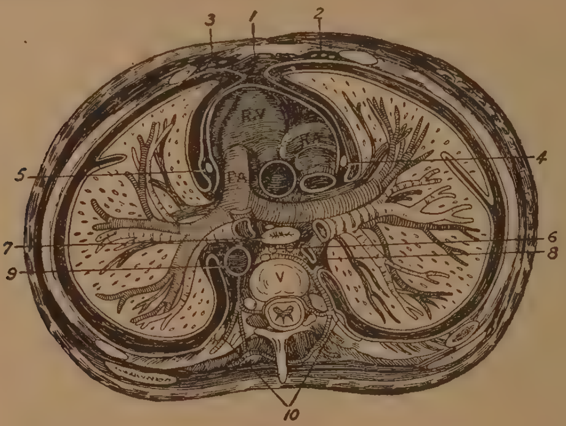


Figure 55.

Figure 55.—TRANSVERSE SECTION THORAX. 1, anterior mediastinum; 2, internal mammary vessels; 3, triangularis sterni; 4, 5, phrenic nerves; 6, thoracic duct; 7, esophagus; 8, vena azygos major; 9, thoracic aorta; 10, sympathetic; R. V., right ventricle; R. A., right auricle; P. A., pulmonary artery; A., aorta; C., superior vena cava; V., dorsal vertebra.

Breathing.—When the chest is enlarged by elevation of the ribs and descent of the diaphragm the lungs follow the chest wall and expand, air rushing into them. When the muscles relax the elastic and over-distended lungs discharge the air through the windpipe.

Air Vesicles.—In the air vesicles the blood is separated from the air by a very thin partition through which oxygen passes to the blood corpuscles. The expired air contains the carbon dioxide and other impurities with which it has been charged while in the air vesicles.

Oxyginized Blood.—The blood, after passing through the lungs, is a brighter red, richer in oxygen, cooler and is rid of its impurities.

NERVOUS SYSTEM.

Function of Nerves.—The nervous system presides over all functions and harmonizes them. It permits the environs to be recognizable. It may be compared to a telegraph system, of which the brain is the central station, to a rider on a horse, or to the captain of a steamship. It is divided into the cerebro-spinal system (brain and spinal cord with their nerves) which presides over the animal functions, motion, sensation, etc., and the sympathetic system which controls the organic functions, nutrition, growth, etc. The sympathetic system is composed of a series of ganglia (large mass nerve cells) in the head and along the front of the spine, connected by nervous cords.

The Brain.—The brain is a huge mass of white and gray nervous matter contained in and protected by the cranium. It is surrounded by

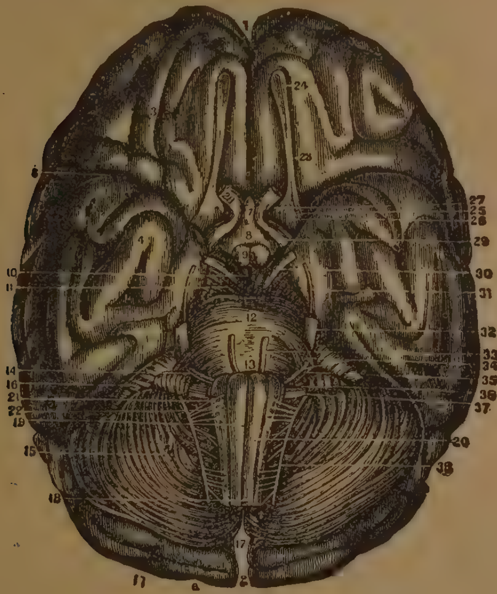


Figure 61.

Figure 61.—BASE OF BRAIN. 1, 2, longitudinal fissure; 3, anterior lobes cerebrum; 4, middle lobe; 5, fissure Sylvius; 6, posterior lobe; 7, infundibulum; 8, its body; 9, corporo albicantia; 10, cineritious matter; 11, crura cerebri; 12, pons Varolii; 13, medulla oblongata; 14, posterior prolongation of pons; 15, middle of cerebellum; 16, anterior part of cerebellum; 17, its posterior part and fissure; 18, medulla spinalis; 19, middle fissure medulla; 20, pyramidal body; 21, retiform body; 22, olivary body; 23, olfactory nerve; 24, its bulb; 25, its external root; 26, middle root; 27, internal root; 28, 29, optic nerve; 30, third nerve; 31, fourth nerve; 32, fifth nerve; 33, sixth nerve; 34, facial nerve; 35, auditory nerve; 36, 37, 38, eighth nerve.

three membranes (meninges): the dura mater, externally, dipping into the fissures to form the falx cerebri, tentorium cerebelli and falx cerebelli which separate and support portions of the brain; the arachnoid, the serous membrane, supplying a fluid which acts as a water cushion for the brain; and the pia mater, the layer carrying the blood-vessels.

Weight of Brain.—The average weight of the brain is fifty ounces in males, and six ounces less in females.

Divisions of Brain.—The brain is divided into the cerebrum, cerebellum, pons varolii and medulla oblongata.

The Cerebrum.—The cerebrum is the largest part of the brain, resting on the roof of the orbit, base of skull, and tentorium cerebelli. It is divided into lateral halves by the falx cerebri. The halves are joined by the corpus callosum. Internally it is composed of white, and externally of gray, nervous tissue. The gray tissue is wrinkled into convolution and is the active portion of the brain, the white matter conducting the nerve impulses to and from it. It is the seat of memory, intelligence, reason, will, motion and sensation.

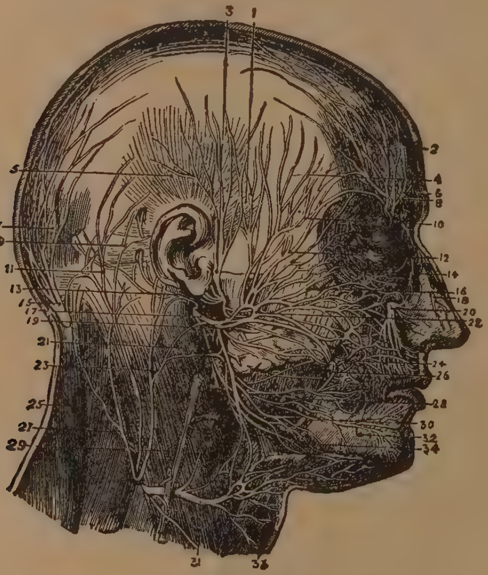


Figure 62.

Figure 62.—NERVES OF FACE AND SCALP. 1, attrahens aurem; 2, anterior belly occipito-frontalis; 3, auriculo-temporal nerve; 4, temporal branches of facial nerve; 5, attolens aurem; 6, supra-trochlear; 7, posterior belly occipito-frontalis; 8, supra-orbital; 9, retrahens aurem; 10, temporal branch of orbital nerve; 11, small occipital nerve; 12, malar branches of facial nerve; 13, posterior auricular nerve; 14, malar branch of orbital; 15, great occipital; 16, infra-orbital branches; 17, facial nerve; 18, nasal nerve; 19, cervico-facial division of facial; 20, infra orbital nerve; 21, branches to digastric and stylo-hyoid; 22, temporo-facial division of facial; 23, great auricular; 24, buccal branches of facial; 25, trapezius; 26, buccinator nerve; 27, splenius capitis; 28, masseter; 29, sterno-mastoid; 30, supra-maxillary branches of facial nerve; 31, superficial cervical nerve; 32, mental nerve; 33, platysma; 34, infra-maxillary branches of facial nerve.

The Cerebellum.—The cerebellum lies beneath the posterior portion of the cerebrum, is gray outside and white inside. It coördinates muscular movements.

The pons varolii connects the various parts of the brain. It conducts impulses to and from the brain.

Medulla Oblongata.—The medulla oblongata is the enlarged upper end of the spinal cord resting in the cranium. It is made of blended white and gray tissue, conducts the nerves from the brain to the spinal cord and contains independent nervous centres which regulate the heart, lungs, blood-vessels, sweating, etc.

Nerves of Brain.—The brain gives off twelve nerves on each side. The nerves pass out through holes (foramen) in the skull and supply the organs of sight, smell, taste and hearing, and also motion and sensation to certain parts. They are: the olfactory (smell), optic (sight), motor oculi (motion to eye), patheticus (motion to superior oblique muscle of eye), trifacial (sensation to face, motion to chewing muscles and nerve of taste), abduces (rolls eye out), facial (motion to face), auditory (hearing), glossopharyngeal (taste and sensation), pneumoga (presides over swallow-

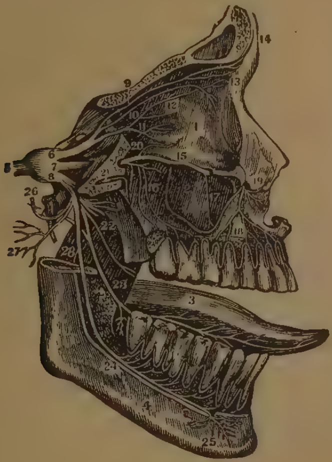


Figure 63.

Figure 63.—FIFTH NERVE. 1, orbit; 2, antrum of Highmore; 3, tongue; 4, lower jaw; 5, Gasserian ganglion; 6, first branch of fifth; 7, second; 8, third; 9, frontal branch; 10, lacrymal branch; 11, nasal branch; 12, internal nasal nerve; 13, external nasal; 14, external and internal frontal nerve; 15, infra-orbital; 16, posterior dental branches; 17, middle dental; 18, anterior dental; 19, terminating branches infra-orbital nerve; 20, orbital branch; 21, ptyregoid nerve; 22, five anterior branches; 23, lingual branch; 24, inferior dental; 25, mental branches; 26, superficial temporal nerve; 27, auricular branches; 28, mylo-hyoid.

ing, heart, lungs, etc.), spinal accessory (motion to muscles, neck and back) and the hypoglossal (motion to tongue).

Spinal Cord.—The spinal cord is a long tail hanging from the back

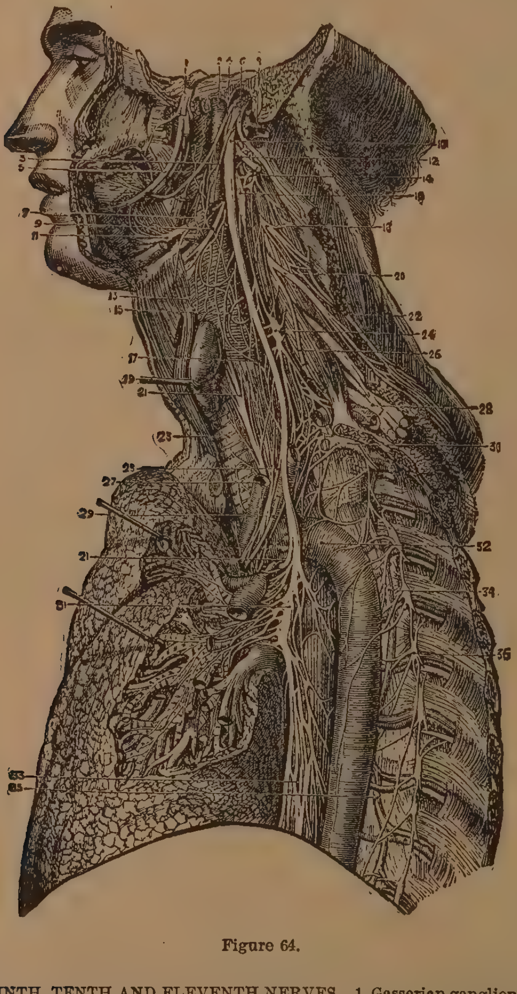


Figure 64.

Figure 64.—NINTH, TENTH AND ELEVENTH NERVES. 1, Gasserian ganglion; 2, internal carotid; 3, pharyngeal branch of pneumogastric; 4, glosso-pharyngeal; 5, lingual; 6, spinal accessory; 7, middle constrictor of pharynx; 8, internal jugular vein; 9, superior laryngeal nerve; 10, ganglion of pneumogastric, 11, hypoglossal; 12, ditto communicating with eighth and first cervical; 13, external laryngeal; 14, second cervical; 15, pharyngeal plexus; 16, superior cervical ganglion; 17, superior cardiac nerve; 18, third cervical; 19, thyroid body; 20, fourth cervical; 21, recurrent laryngeal; 22, spinal accessory; 23, trachea; 24, middle cervical ganglion; 25, middle cardiac nerve; 26, phrenic; 27, left carotid; 28, brachial plexus; 29, phrenic; 30, inferior cervical ganglion; 31, pulmonary plexus; 32, aorta; 33, esophageal plexus; 34, vena azygos superior; 35, vena azygos minor; 36, gangliated cord of sympathetic.

of the brain and contained in the spinal canal. It is sixteen to eighteen inches long and surrounded by three membranes like the brain.

Upper Section.—Upon section the cord (Fig. 59.) is seen to be composed externally of white nervous tissue, and internally of the gray, which is arranged somewhat in the shape of the letter H. The cord is divided by two antero-posterior fissures into two equal lateral halves, which are united in the centre by a bridge of gray matter.

The spinal cord is a great nerve cable carrying fibres to and from the brain; it also coördinates motion, presides over the nutrition of certain parts and contains independent nervous centre.

From the anterior horn of the gray matter arises the motor roots of the spinal nerves and from the posterior horn the sensory roots.

Spinal Nerves.—Each spinal nerve, of which there are thirty-one pairs, consists of the anterior or motor and the posterior or sensory root. These unite within the spinal canal and form a single cord (Fig. 65), which passes through the opening between the vertebræ and divides into two trunks, one for the anterior and the other for the posterior surface of the body.

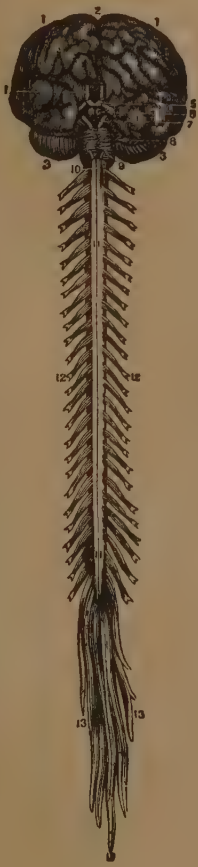


Figure 59.

Figure 59.—BRAIN and CORD. 1, 1, hemispheres of cerebrum; 2, great middle fissure; 3, cerebellum; 4, olfactory nerves; 5, optic nerves; 6, corpora albicanlia; 7, motor oculi; 8, pons Varolii; 9, fourth nerve; 10, medula oblongata; 11, 11, medula spinalis; 12, 12, spinal nerves; 13, cauda equina.

Cervical Plexus.—The anterior branches of the four upper cervical nerves unite with each other to form the cervical plexus which gives off branches to the side of the head, neck, shoulder, chest and diaphragm. The anterior branches of the fifth, sixth and seventh cervical nerves unite, the fifth receiving a branch from the fourth; the eighth cervical and first dorsal nerves unite; these cords form the brachial plexus, and after sending nerve trunks to the muscles of the neck and sides of the chest below the collar bone, these two trunks each send off a trunk which unite to form a third or posterior trunk which divides into two branches, supplying the muscles and skin of the outside and back of the arm, forearm and hand.

Inner and Outer Trunks.—The inner and outer trunks are continued down the inside of the arm, and again each sends a branch to form a middle cord, the median nerve. The external cord then becomes the musculo-cutaneous, and the internal, the ulnar.

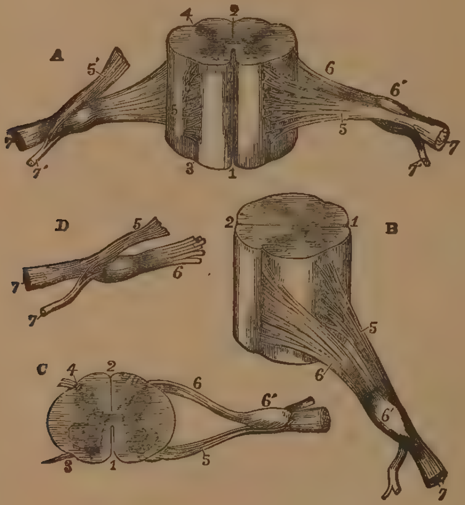


Figure 60.

Figure 60.—VIEWS OF SECTION OF CERVICAL CORD. A, anterior surface; B, right side; C, upper surface; D, nerve roots; 1, anterior median fissure; 2, posterior median fissure; 3, anterior lateral depression; 4, posterior lateral groove; 5, anterior roots; 6, posterior roots; 6', ganglion; 7, spinal nerve; 7', posterior branch.

Median Nerve.—The median nerve (Fig. 66) gives off branches to the muscles and to the skin of the hand. The ulnar nerve is placed on the inner side of the arm and supplies the forearm and hand. The musculo-cutaneous supplies the skin and muscles of the forearm and wrist.

Spinal Nerves.—The twelve dorsal spinal nerves send branches along the ribs and supply the muscles of the back.

Lumbar Nerves.—The five lumbar nerves send posterior branches to the muscles of the back; the anterior branches unite to form a plexus which sends branches to the muscles of the belly and the genital organs; the largest branch, the crural nerve, is distributed to the front of the thigh.

Sacral Nerves.—The fifth lumbar joins the sacral nerves to form the sacral plexus; its largest branch is the great sciatic which passed down the back of the thigh dividing at the knee into the external and internal

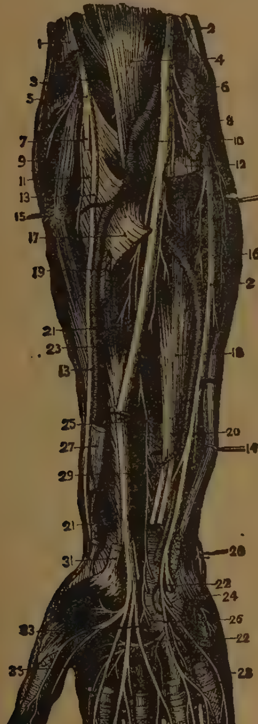


Figure 65.

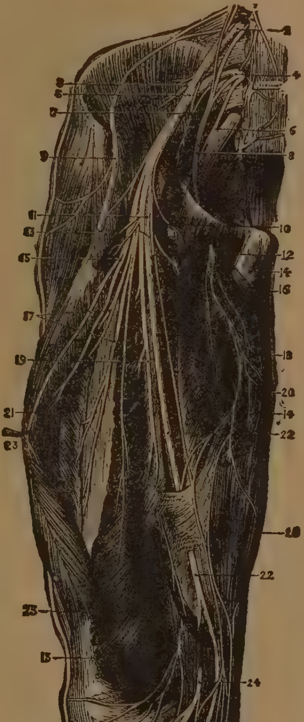


Figure 66.

Figure 65.—DEEP DISSECTION OF FRONT OF FOREARM. 1, supinator longus; 2, ulnar nerve; 3, brachialis anticus; 4, biceps; 5, musculo spiral; 6, median; 7, posterior interosseous; 8, pronator teres; 9, extensor carpi radialis longior; 10, brachial artery; 11, supinator brevis; 12, flexor sublimus digitorum; 13, radial nerve; 14, flexor carpi ulnaris; 15, extensor carpi radialis brevior; 16, ulnar artery; 17, origin flexor sublimus digitorum; 18, flexor profundus digitorum; 19, tendon pronator teres; 20, dorsal branch of ulnar nerve; 21, radial artery; 22, deep branch of ulnar nerve; 23, flexor longus pollicis; 24, adductor minimi digiti; 25, anterior interosseous nerve; 26, digital branches of ulnar nerve; 27, tendon of supinator longus; 28, one of the lumbricales muscles; 29, pronator quadratus; 31, tendon flexor carp iradialis; 33, digital branches median nerve; 35, abductor pollicis.

Figure 66.—NERVES OF THIGH. 1, sympathetic ganglia; 2, third lumbar; 3, branches to iliacus; 4, fourth lumbar; 5, anterior crural; 6, lumbo-sacral; 7, branch of the psoas; 8, obturator; 9, external cutaneous; 10, nerve to pectineus; 11, branch anterior crural; 12, superficial division of obturator; 13, sartorius muscle; 14, adductor longus; 15, branch to rectus; 16, deep division of obturator; 17, branches to vastus externus and crureus; 18, adductor brevis; 19, branch to vastus internus; 20, adductor magnus; 21, vastus externus; 22, internal saphena; 23, rectus femorio; 24, patellar branch of saphena; 25, vastus internus; 26, gracilis.

popliteal nerves; these are continued down the leg as the anterior and posterior tibial nerves supplying the leg and foot.

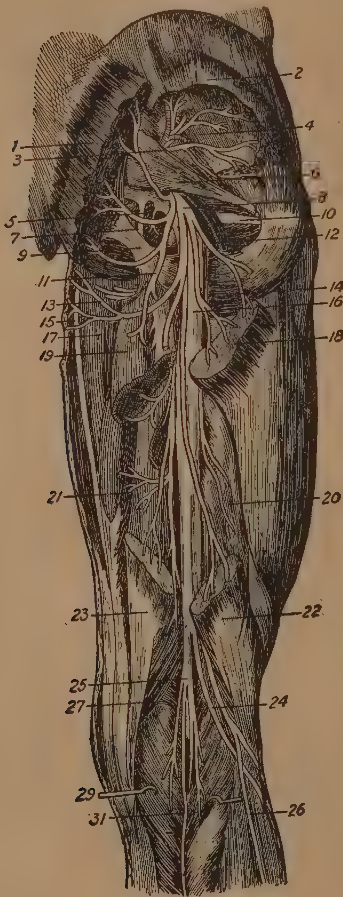


Figure 67.

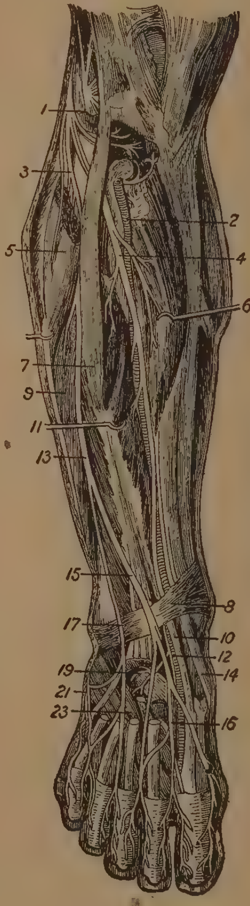


Figure 67a.

Figure 67.—BUTTOCK AND BACK OF THIGH. 1, gluteus maximus; 2, gluteus medius; 3, glutial artery; 4, gluteus minimus; 5, nerve of obturator internus; 6, pyriformis; 7, pudic nerve; 8, small sciatic nerve; 9, great sacro-sciatic ligament; 10, obturator internus; 11, inferior gluteal nerve; 12, tendon obturator internus; 13, inferior pudendal nerve; 14, quadratus femoris; 15, gracilis; 16, great sciatic nerve; 17, adductor magnus; 18, insertion gluteus maximus; 19, origin of semitendinosus and semimembranosus; 20, short head of biceps; 21, semimembranosus; 22, tendon of biceps; 23, tendon of semitendinosus; 24, external popliteal nerve; 25, internal popliteal nerve; 26, communicans fibrelaris; 27, popliteal artery; 29, gastrocnemius; 31, external saphenous nerve.

Figure 67a.—FRONT OF LEG. 1, external popliteal nerve; 2, anterior tibial artery; 3, musculo-cutaneous nerve; 4, anterior tibial nerve; 5, peroneus longus; 6, tibialus anticus; 7, extensor longus digitorum; 8, anterior annular ligament; 9, peroneus brevis; 10, tendon of extensor proprius pollicis; 11, extensor proprius pollicis; 12, dorsal artery of foot; 13, musculo-cutaneous nerve; 14, tendon of tibialus anticus; 15, internal branch of musculo-cutaneous nerve; 16, cutaneous branch of anterior tibial nerve; 17, external branch of musculo-cutaneous nerve; 19, deep branch of anterior tibial nerve; 21, external saphenous nerve; 23, extensor brevis digitorum.

Book II.

THE MYSTERY OF LIFE, DISEASE AND DEATH.

The Body a Wonderful Machine.—In the year 1876, the Centennial anniversary of our nation's birth, millions of men, women and children, coming from every quarter of the globe, traveled hundreds or even thousands of miles to see the Great Exhibition in Philadelphia which celebrated a century of Liberty and Independence in our favored land. Among all the marvels of art, of science and of mechanical skill grouped in these grand treasure-houses of products from every country, no one attracted more attention from foreigners and citizens alike than the magnificent Corliss engine which, set in motion by President Grant and the Emperor of Brazil on the opening day of the fair, moved most of the machines in Machinery Hall until the end of the Exhibition. This superb show has long since passed away; but in order to see a far more wonderful machine than even the great Corliss engine of the Centennial, each of my readers need only examine his own body, which, in its marvelous contrivances and the astonishingly exact fitness of all its parts for the duties they are required to fulfil, infinitely surpasses any mechanical apparatus hitherto constructed by man.

Comparison With Other Machines.—Thus, for example, no telegraphic machine ever exceeded in delicacy and complexity the human brain and nervous system; no pump ever did its work more successfully than our hearts do theirs in driving the blood through every artery and vein into all portions of the human frame; no chemical apparatus ever performed its part in digesting solid substances better than the human stomach and associated organs fulfil their office as long as the whole body is in perfect health.

A Self-Repairing Machine.—But every one can behold at home, in his own body, a *more* wonderful machine than any which those vast crowds journeyed so far to see in the Centennial Exhibition, and this infinite superiority of the All-wise Creator's work over any mere man-made contrivance lies in the inborn power of the former to repair itself when injured, this repair being generally more or less complete according as due care is exercised in obedience to the rules of hygienic, medical and surgical science to favor the reparative tendency in every appropriate way. If, for instance, the great walking-beams of the Corliss engine had been broken, the whole machine might have stood still until doomsday, as far as any effort to mend itself was concerned; but if a human being were to break his walking-beams, that is to say, the bones of his legs, and were wise enough to lie still with the broken limbs in a proper position, maintained by suitable surgical appliances, the ends of the fractured bones would, after a few weeks or months, "knit" themselves together, and he might in time be able to run and jump as well as before the accident.

INESTIMABLE VALUE OF A KNOWLEDGE OF HYGIENE.

Anatomy.—As most persons are doubtless aware, the study of this most wonderful of all machines, the human body, is called Anatomy, a term derived from two Greek words signifying *dissection*, because it is only by separating such a body into its component parts that we can tell how it was put together.

Physiology.—Physiology describes the active operations of these various parts and organs during health, as, for instance, how the heart propels the blood through the arteries producing the pulse, how the stomach digests food, and also how the operations of the special senses, such as sight and hearing, are performed.

Hygiene.—Hygiene, the art of preserving health, derives its name from *Hygiea*, the appellation which the old Greeks gave to their fabled Goddess of Health. It is the practical application of the sciences of Anatomy and Physiology to the hourly and daily needs of every man, woman and child in the world, and it is far more useful to humanity than practice of Medicine and Surgery, because, even with our present knowledge of Sanitary science, we can avoid many more attacks of disease than we can cure. It, therefore, constitutes the chief subject of this book, the purpose of which is to teach its readers how to keep their own valuable bodies—worth, as long as they are not sick, tenfold more than their own weight in the purest gold would be—sound, healthy and free from taint of disease.

Value of Health Laws.—Some physicians of profound learning declare that all the time, trouble and money employed in acquiring their knowledge of medical science would have been well expended in gaining their control over diseases, even if that mastery should never be exercised outside of their own households. And further, that the longer they live and the more they practice medicine, the more sure they become that the cure of existing disease, and when that is impossible, the relief and mitigation of its pain, is the greatest service they can render to humanity, or that humanity in time of need can render unto them.

Preventive Medicine.—If, then, medical practitioners find the ability of curing disease in themselves and their own families is alone sufficient reward for all the toil of their lives in study, how much more worth while is it for the readers of this volume to devote their best efforts to learning from its pages how to prevent diseases, or to nip them in their very bud by appropriate hygienic measures. Obviously, preventive medicine has all the advantages over curative medicine that the traditional ounce of prevention has over the black, bitter, and oft ineffectual pound of cure. Hence it is that the far-sighted prophets of the medical profession agree with singular unanimity that the medical science of the future will be "Preventive medicine," if it has not already become so.

Value of Health.—All those who have learned the value of health by its loss will approve most heartily the advice here given to everybody, and especially to young people, that they should continually remember health is the one worthy object in this life to the attainment of which they can most profitably devote their time, strength and energy, and all the intellect, all the arts, all the sciences, and all the industries of mankind are chiefly valuable to each individual, as they contribute to the acquisition and maintenance of typical health for his individual body and mind. Or to coin an aphorism which should be posted over the doorway of every dwelling in the land: Perfect health is the *pure gold*, whilst without it, power and glory and riches are but the *mere dross* of human existence.

Definition of Hygiene.—The late illustrious Dr. Parkes, who probably did more towards awaking public interest in the care of health in all English-speaking countries than any other philanthropist of our time, has left a worthy monument of devotion to his fellow-men, in his comprehensive treatise upon the subject, which contains the following unequalled definition: "Hygiene is the art of preserving health, that is of obtaining the most perfect action of body and mind during as long a period as is consistent with the laws of life. In other words, it aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote."

A Perfect System of Hygiene.—In the widest sense of its meaning the word Hygiene signifies rules for perfect culture of both mind and body, because it is never worth while to attempt the cultivation of either of these integral parts of the being separately; since each acts and reacts upon the other in ways which are mysterious and intricate to the utmost degree. For a perfect system of Hygiene, therefore, must be combined the knowledge of the clergyman, the physician and the schoolmaster in order to train the material body, the intellectual powers and the moral soul in the most complete and most accurately balanced order. Then exclaims Professor Parkes, "If our knowledge were exact and our means of application adequate, we should see the human being in his perfect beauty, as Providence, perhaps, intended him to be; in the harmonious proportions and complete balance of all his parts, wherewith he came forth from the hands of his Maker, in whose divine image we are told he was, in the beginning, made."

The Science of Life.—Dr. J. S. Billings, late president of our National Board of Health, considers that the field of Sanitary Science is still more extensive, and declares that the study of Hygiene includes the examination of the conditions which affect the generation, development, growth and decay of individuals, of nations and of races, being on its scientific side co-extensive with Biology, or the science of life in its broadest sense, including, therefore, Sociology. Whatever can cause or help to cause discomfort, pain, sickness, death, vice or crime, and whatever has a tendency to avert, destroy or diminish such causes are matters of interest to the Sanitarian, and the powers of science and the arts, great as they are, afford, even when taxed to their uttermost, only an approach to the solution of the problems with which he is concerned.

Self-Preservation.—But if we go no farther than Dr. Parkes' definition that Hygiene is the art of preserving health, it appears obvious that, since self-preservation is the first law of nature, and from first to last is the most universally inexorable in its demands, a thorough investigation of the best methods of securing self-preservation of every organ and function in entire integrity, such as is attempted in this book, might be rendered the most important, the most useful, and the most interesting, which could possibly engage the attention of every man, woman and child in the world. It is said "might be," because as is commonly observed, few people value health properly until they lose it, and therefore it can scarcely be hoped that all readers will appreciate now fully the inestimable value of sanitary precautions in self-preservation.

A Day of Death.—But the day will come to all, except the few whose lot it is to fall by sudden death, or disease accompanied with failure of intellect, when they will realize, let it be hoped before too late, how momentously true are these words of urgent remonstrance that it will pay better to preserve every part of our valuable bodies and minds in complete perfection, by obedience to the laws of hygiene, than it will to pursue in violation of them any other occupation or amusement ever invented by man.

Place of Medicine and Surgery.—From this point of view practice of medicine and surgery, which have for their objects the remedying of evils resulting from neglect of hygienic laws for our self-preservation, hold a secondary and subordinate place in the interests of mankind, being of less real and vital importance to each and every one of us and to humanity at large.

Sound Mind and Body.—Admitting, as most people will, without dispute that according to the old adage, "the proper study of mankind is man," little farther argument is needed to prove that the maintenance of health is the object towards which he can make the best and wisest application of such study, because, as is declared by the ancient Roman poet, the one earthly blessing we dare ask for unreservedly, a sound mind in a sound body, is the great element of all earthly happiness, without which the richest prince, the most powerful king, or even the wisest sage, is more miserable than its very meanest possessor.

HOW TO PRESERVE HEALTH.—A MOST VALUABLE KNOWLEDGE.

Our Chief Interest and Duty.—The pre-eminent value of the study of man and nature, as a means for obtaining that condition of every enjoyment, health of body and mind, being acknowledged, it is easy to see farther that the surest mode of securing health is by acquiring the most extensive possible knowledge of its derangements, as effected by the countless external agencies and forces of nature, and thus learning what noxious influences we must avoid, because, as every one knows, ignorance of nature's laws no more absolves us from the penalty of their violation than will a similar want of knowledge be accepted by our courts of law for an infraction of their code. For example, the innocent child who eats a spoonful of the deadly poison, arsenic, believing that it is sugar, and in ignorance of that divine ordinance which has decreed it to be fatal to us, is as surely and, without assistance, as fatally poisoned as if he had committed the most monstrous sin; whilst on the other hand a man who has swallowed the same drug, though he be the greatest criminal in the world, if he is well enough informed concerning the laws of nature to promptly take an emetic, will be saved, as a direct consequence of that superiority of wisdom.

Punishment of Ignorance.—Since then ignorance of causes which produce the changes of disease is continually punished with the blackest of all crimes, by death; and, on the contrary, knowledge of these same causes is rewarded with the highest earthly prizes for resplendent virtue, Life and Health, it is manifest that our chief interest, and our duty, in order to secure these blessings of life and health for those under our care, many of whom are as ignorant of common injurious agents as a baby can be of arsenic, is a comprehensive study of disease with all its innumerable causes, symptoms, remedies and effects.

Simplicity of Hygienic Science.—The science of Hygiene, like all other great things, is exceedingly simple. This hypothetical case of an innocent child eating Arsenic through ignorance of its deleterious properties is a perfect illustration of the sanitary errors we and all our friends and relatives are constantly committing almost every moment of our lives. The great duty in writing this volume is to teach its readers and help them to teach others whom they can influence, how to know and avoid or escape "Arsenic," to continue the figure of speech, in all its various forms around them. And whilst the good thus accomplished must fall far short of that which is intended, it is hoped that many readers will hereafter have occasion to offer sincere thanks in their hearts, that they and those dear to them have been saved from unnecessary suffering by the earnest cautions and warnings against eating and drinking, chewing and smoking, breathing and wearing, working and thinking "Arsenic" and its kindred poisons, in their infinitely diverse aspects, which will be urged upon their remembrance.

Preventable Loss of Life.—That these dangers to health from the multitude of natural forces and influences which everywhere assail us are not mere visionary ones is shown by the fact that, from reliable statistics, it is estimated the total annual loss of life in the United States, from causes well known to be preventable, is certainly equal to over one hundred thousand persons, whilst if we consider what is theoretically possible if the laws of hygiene were generally and strictly observed this enormous death roll would double or even treble its magnitude.

An Unnecessary Sick List.—In addition to these unnecessary deaths, there are probably one hundred and fifty thousand persons sick in the United States from causes which there is good reason to think are preventable, and it is reasonably certain that the average amount of work accomplished in this country is only about seven-tenths of what it would be if all attacks of preventable diseases were avoided by due sanitary care of our bodies.

Ancient Ignorance of Health Laws.—If we look back into the history of past ages, when Hygiene was comparatively almost unknown, we can perhaps most readily trace the benefits of sanitary science. The Romans constructed some magnificent aqueducts for supplying the seven-hilled city with pure water, and they also built certain capacious sewers for removing their refuse matters, but what we understand by public sanitary effort they were utterly unacquainted with. Even England, with all her greatness and wealth of intellectual production, was a very hot-bed of disease, and to English history we may turn for examples of the most frightful pestilences. What could be more terrible than the "black Assizes," a session of an English law court held in Oxford in 1577, where all who were present in the court room—the judge, the sheriff, and some three hundred other persons—died within forty-eight hours.

Horrors of the Black-Death.—What could be more appalling than the Black-death of the fourteenth century, which reappeared in an epidemic form as the plague five times in the next century, and in the year 1665 carried off the enormous number of seventy thousand persons. So terrible was this disease that one writer says, "The plagues of London do commonly kill one-fifth of its inhabitants." In fact, inhabitants of the Northern States can scarcely form an idea at the present day of such an epidemic as visited London in the year 1665.

Defoe's Narrative.—The narrative of Defoe, depicting its scenes of daily occurrence, is full of pathetic incidents. He tells us that all the infected houses were closed, with their inhabitants imprisoned within them. They were marked on the outside with a red cross, and written over the door was, "Lord, have mercy upon us."

Causes of the Plague.—When, however, we consider how the English people of those days lived we are surprised, not that epidemics of this terrible kind occurred frequently, but that they were ever absent. Most of the dwellings were of wood, and so tightly plastered over that a breath of fresh air was an entire stranger. Our English ancestors had to pay a window tax, so that from economical motives even the light was to a great extent excluded. The floors of the houses were generally made of loamy earth, covered over with rushes. From time to time fresh rushes were strewn upon the old ones, and the decaying mass was left sometimes, it is said, for twenty years without removal, concealing fish bones, broken victuals and other filth. And this was what is called the good old time.

PROGRESS OF PRACTICAL HYGIENE.

Birth and Death Records.—Some of the clearest numerical evidences proving the benefits of Hygiene are derived from the record of births and deaths accurately kept in Geneva, Switzerland, for the last three hundred years. From these we learn that, three centuries ago, the average length of a human life was only twenty-one years, whilst now, in the twentieth century, it has risen to forty years; then, more than one-fourth of all the children born died in their first year; now, less than one-sixth perish in their first twelvemonth. In the sixteenth century, only three per cent. of the inhabitants of Geneva lived to round out their three score and ten years; now, more than eighteen per cent. outlive the period for human life allotted by the Royal Psalmist of Israel. As many now live to be seventy as then survived the age of forty-three.

Life Lengthened.—Again, statistics prove that in the crowded city of Liverpool, before proper sanitary measures were adopted, thirty-nine persons in every thousand died each year, whilst at the present time the number of deaths per thousand is only twenty-four. The mortality in England's East Indian army has been reduced from sixty-nine to twenty per thousand annually, and so great a difference has this made that, in a single period of ten years, more lives have been saved in that army than formed the whole British forces at the battle of Waterloo. The lessons taught in our late terrible Civil War in America are in this respect equally impressive, for it was found that, through the often inevitable neglect of proper sanitary care, feeding and clothing of the troops, for almost every man killed in battle two men died of disease, nearly all of which might have been prevented had every resource of science for the preservation of health been duly applied.

Theatre of Vitality.—The readers of the preceding section being, it is trusted, fully convinced of, first, the inestimable importance, and second, the great practical feasibility of preserving health for ourselves and our children by attention to the laws of hygiene; we will now commence at the very foundation of the science by attempting to explain, or at least to define, that wonderful Vitality which necessarily forms the theatre, as it were, of all the operations with which we have to deal in pursuing the study of Sanitary Science.

What is Life?—Life, the life to which we, in common with all other created beings, cling so despairingly, and which is only less mysterious than its inevitable and inexorable termination—the mystery of death—has been defined by a celebrated French physiologist as "organization in action." Taking the word organization in its usual sense as meaning a body made up of organs, as the heart and lungs, for example, this brief phrase admirably expresses the ordinary condition of living bodies, as offered to us everywhere in water, air and earth for our inspection and study.

Microscopic Marvels.—In the lowest forms belonging to the animal kingdom, the active operations which characterize life are capable of actual demonstration under the microscope. In the curious creatures called Amoeba, for example, which look like microscopic drops of transparent jelly, we have presented to our view all the important functions of vitality in its simplest manifestation. In these strange little animals we may really see correspondingly minute vegetables gradually enclosed, partly digested, their nutritious ingredients appropriated, and the remainder cast away in a comparatively short time. Of course the functions of development, growth, reproduction, locomotion and so forth, which are in the animal kingdom the attributes of life in some of its stages, must generally enter into our consideration of the subject, although they are not essential to the idea of vitality.

Normal and Abnormal Life.—Now, life may be natural or *normal;* that is, nutrition, excretion and so forth, may be so proportioned to each other that the individual possesses the greatest perfection of each and all of its powers, and thus enjoys what is commonly called health. Or, again, the various functions above referred to may bear a disturbed or *abnormal* relation to each other, constituting the condition we denominate disease, the general, although not quite universal, index of which in our race is *pain.*

A Doctor's Life-Work.—Here we have the physician's life-work set before us in a single sentence, and it is as well the great business of his beneficent calling from the days of Hippocrates, the father of medicine, down to the end of Time, namely, to obviate in suffering humanity these disturbances of bodily action which constitute disease, and to relieve, or at least palliate, their eloquent appeal for succor—*pain.* No earthly service can win a richer reward from the people of all generations and of all nations. No human gratitude can compare with that poured forth by patients who have just been delivered from the agony of physical pain.

Disease is Disturbed Life.—Since disease consists in the disturbance—that is, the alteration for the worse of nutrition, excretion and so forth—in two words is disturbed life, it is obvious that the causes of disease are any agencies whatever which produce this derangement. Of course, then, they necessarily include all the innumerable powers and forces which surround us. Thus, the excess or the privation of the air we breathe, the light and heat which promote the conversion of food into our muscle, blood and brain, the electrical forces which modify our nutrition—any of the myriad diverse influences which may be brought to bear upon our frames—are at times more or less potent causes of disease.

Life, Health, Disease.—Life, then, is "organization in action." Health is "perfect organization in perfect action." Disease is the "disturbance of perfect organization, or of perfect action, or of both together;" and disturbance or perversion may occur, of course, with both organization and action in either of the two opposite directions of excess or deficiency. Thus, for example, we sometimes see a perversion of the organization of the skin of the leg in the direction of overgrowth, constituting the curious disease called Elephantiasis, because it makes the sufferer's limb look like that of an elephant; or, on the contrary, we may meet with a wasting away of the muscles of the arm, producing one kind of paralysis or palsy.

Functional Diseases.—The functional diseases, as distinguished from organic diseases, are those in which the function or action of an organ is disturbed, without any visible alteration of its substance or texture having taken place. Illustrations of these conditions are readily found in cases, for instance, of excessively violent, rapid and irregular beating of the heart, commonly spoken of as palpitation of the heart; or, on the other hand, when the function of the heart is performed so feebly that it seems to almost cease, as is frequently observed in an ordinary fainting fit.

Deranged Machinery.—Perhaps this important idea, that disease is a disturbance of natural life, can be most forcibly impressed upon the reader's mind by a mechanical comparison. Thus, for example, our bodies, with all their ingenious contrivances and wonderful adaptations of parts to the various objects they are designed to fulfil, may be compared to an intricate machine such as a steam-engine, which, when in complete running order, with every valve, wheel and lever acting in just mutual relationship, represents, except that it is far less complex, a healthy human frame. But let a screw work loose so as to allow a little leakage at the steam-pipe, or the oil dry up so as to prevent the free play of a valve, or an eccentric wheel slip a little on the shaft so as to shorten the stroke of its rod, and we shall have resulting an imperfect action, manifested, perhaps, by an audible escape of steam, a slower rate of movement, or a loss of operative power; in fact, the precise equivalent of that *derangement* of our systems which from time immemorial has received the name of *disease.*

Mending the Machine.—If, now, we suppose a skillful workman called in to rectify the disordered engine, we will see him examine the movements while running faster or slower, try with his wrench one and another screw-head, and listen here and there for the rush of steam, all these tests being systematically applied to detect the exact seat and character of the little mechanical defect which interferes with the perfect action or function of the engine, and on which, consequently, the whole disorder depends. Now, just as the machinist employs his trained senses to discover the disease of his engine from its symptoms, that is to say, its interferences caused by that valve-disease, or that piston-rod disease, with the best action of the machine, so a thoroughly scientific physician, when consulted as a practitioner of either Preventive or of Curative Medicine, will devote his keenest and best-trained perceptions, aided if needful by the microscope, the stethescope, the thermometer and other mechanical appliances, towards determining the threatened or existing changes of structure in a patient's body by the symptoms, that is to say, the departures from the perfect action of typical health, which their interference, even in their earliest stage of development, often produces in the functions of his body.

Old and New Views of Disease.—This view, that all diseases are simply departures from and disturbances of perfect health, may seem strange to some of my readers, because, not a great many years since, both medical men and the community at large looked upon each distinct malady as a separate existence or *entity* which, in some mysterious way, fastened upon our vitals, and, if not cast out by drugs more potent than itself, destroyed its victims in the deadly struggle which ensued between it and the life-force of the individual assailed. At present, however, the more enlightened physicians recognize no such antagonists, but consider the disorders to which all flesh is heir as disturbances of perfect life, which as a rule are gradual in their commencement, and even more gradual in their decline. Hence, such terms as to struggle against a disease, or to do battle with a malady, should only be used in a figurative sense and with reference to the causes of complaints or to the symptoms and effects of an illness, as, for example, the debility and the diarrhœa which occur in typhoid fever.

Knowledge Needed.—In the illustration of a disordered steam-engine used above, the importance of calling in a skilled artisan to examine and repair the apparatus has been referred to, and the same precaution is a thousand times more necessary when that infinitely complex and delicate machine, the human body, is disturbed in disease. In such a case only the best trained and most experienced workman that can possibly be obtained should be permitted to meddle in any way with the derangements of this marvelous structure.

Necessity of This Book.—If each inhabitant of America could have an experienced doctor constantly at his elbow to advise him in all the medical and sanitary emergencies of life, these pages would never be needed. As, however, such a desirable precaution is an impracticable one, this work is offered as a substitute for the medical guide, who should be sent for as quickly as possible whenever any emergency arises or any departure from perfect health makes itself manifest. On the other hand, when, as must frequently happen, in small towns, villages, in rural districts, at sea, or whilst traveling in foreign lands, a doctor cannot be procured immediately, prompt treatment by any intelligent person as directed in this work will surely result in saving an immense number of lives and a vast amount of human suffering.

Observance of Proper Precautions.—Sometimes a skeptical spirit leads men, who put on oftentimes a great assumption of superior wisdom, to ridicule the scrupulous care which most contributes to health and long life, quoting, perhaps, the old Latin proverb which declares that he who lives medically lives miserably, as an excuse for their neglect of proper precautions against disease. Even such persons, however, with all their lofty contempt for prudence, may occasionally be seen hastily withdrawing from a railway track when a locomotive approaches, or cautiously avoiding a small-pox patient if they happen to recognize one in the street, and very few, after their boasted courage has, by involving them in serious loss or injury to health, justified the name it will commonly receive of foolhardiness, fail to lament that they had not been wise in time, learned how to avoid the danger of accident or disease, and practiced that knowledge with the watchful care so urgently recommended in this book.

Accident to the Eye.—A most important and useful lesson in regard to the wisdom of sanitary precautions and surgical or medical treatment may be drawn from the common accident of having a cinder enter the eye (as it is called) on a railway journey. Trivial as this misfortune seems at first, the painful irritation which the tiny particle of coal, if not removed, soon sets up under the lid is far more troublesome than the hygienic precaution of wearing wire-gauze spectacles for a lifetime of railroad traveling would be. And the simple operation of removing the cinder as advised in the chapter of this work on diseases and injuries to the organs of vision, saves the person days or weeks of intense suffering, and effects what the blundering stickler for a nature cure would have set up such a violent inflammation to accomplish, that its patient's eye would very likely have been ruined for life in the operation of washing away the tiny cause of disturbance.

Efficacy of Prompt Remedies.—And in regard to medical treatment the same truth is manifest. Every physician in large practice can, probably, bring forward scores of cases where a single hypodermic injection of morphia has cured neuralgia, a scruple of quinine has broken up ague, a few doses of cough mixture has cut short an attack of bronchitis, or two or three pills of acetate of lead and opium have checked an attack of cholera morbus, which if left to the vaunted curative power of nature would in all human probability have cost the patient his life, by the long-continued suffering and exhaustion they would involve. In fact, the great business of an intelligent medical practitioner is often to correct the murderous blunders which are constantly being made in patients' bodies by the sticklers for a nature cure. To do this we happily possess, in the wide range afforded by nature among her medicinal substances, remedies which, if used early enough and wisely enough, grant us a hope of cure in every disease except old age, which, if it be looked upon as arriving to one particular organ of each individual sooner than to the others, is but a part of Death, the unconquerable adversary of all earthly life.

Right and Wrong Medication.—In reference to this question of medication, there is no doubt that many people commit serious errors in each direction of excess and deficiency. On the one hand, there are numerous individuals and whole groups or sets of persons who refuse to take into their stomachs certain of our most valuable drugs because these remedial agents have been in other times, or other ages, abused, to the grievous injury of mankind. Thus, it is by no means unusual for a patient to consult his physician and, as the latter is writing his prescription, to say, "Doctor, please don't give me any calomel, for I had an uncle who always said his constitution was injured by the mercury he took when a child." And yet, such a request is not one atom more reasonable than it would be for the same person to take his watch to be repaired and say to the watchmaker, "I want this timepiece put in first-rate order as quickly as possible, but don't use a screw-driver in fixing it, for I have a prejudice against screw-drivers, because an uncle of mine had his watch ruined by a screw-driver when he was a boy."

Uses and Abuses of Calomel.—We can scarcely dispute the assertions that calomel (and mercury in other forms as well) is a very active medicine, potent for ill as well as for good, and that half a century ago it was far too freely and too frequently administered; but when it is given to a suitable case, at the right time and in proper quantity, few remedies are more valuable in their effects. Again, on the other hand, there is a class of people who, in consequence of having once experienced the blessings of medicine as a reliever of pain, from fashion, or from pure lack of other occupation, go to the opposite extreme of overdosing, and fill their stomachs with immense quantities of regular and irregular prescriptions, to their own serious or even fatal injury.

Right Way to Meet Disease.—Common sense dictates a course of action midway between these extremes, not only guarding oneself vigilantly on all the more important points of sanitary precaution when reasonable suspicion of danger exists, but meeting the attacks of disease, which, in spite of every care, will be sure to fasten on humanity sometimes, as promptly and energetically as medical science can enable man to do.

Danger of Neglecting Oneself.—But whilst extensive experience has taught physicians a strong confidence in the efficacy of hygienic measures against disease or accident, and likewise a robust faith in the power of medicine over disease, as well as over most of its causes before they begin their operations upon the human body, they know enough of human nature to feel sure that many readers will not only insist on trying occasionally how far they can venture unscathed in violation of the laws of hygiene, but also that, when they begin to suffer for such disobedience, they will often persistently neglect to avail themselves of "the pound of cure" which stands prescribed, trusting that their disease "will get well of itself."

The Headstrong Individual.—For such headstrong individuals the best wish it that they will test the value of these counsels first, in regard to some sanitary regulations which have attached to them the penalty of temporary pain, rather than that of death, or of permanent injury. In other words, that if the bold seeker after truth is, for example, predisposed to consumption, as pointed out in the sections on age, hereditary tendency and the like, he will be careful about his lungs as he finds advised, and buy his stock of wisdom with experiments, let us say, upon his digestive apparatus, when the punishment may happily prove a mere attack of dyspepsia, that cruel enemy of civilized life, which has been so poetically and so truthfully described as the "remorse of a guilty stomach."

Book III.

PREVENTIVE MEDICINE.

PART I.

WATER IN ITS HYGIENIC RELATIONS.

THE USES OF WATER.

Adaptation of Water to Human Needs.—Few people who enjoy the benefits of water think what a wonderful and unanswerable argument is afforded by them in favor of the goodness of an all-wise Creator to his creature, man. Of all the fluids with which we are acquainted water is by far the best adapted to the almost infinite variety of human wants, and it is the one of all others most abundant in nature, constituting as it does about three-fifths of the surface of our globe, and nearly seven-tenths of the bodies of man and of most animals. If the common fluid upon which we had to depend were quicksilver, or oil, its boiling-point would be so high that articles of food which we attempted to cook in it would be seriously injured in the effort to prepare them by its aid; and, on the other hand, nearly all the advantages of ice would fail us, in consequence of the exceedingly low temperature at which these substances remain fluid.

Water in All Substances.—Water was considered by the ancient philosophers as one of the four elements out of which all visible objects were constructed; and, in reality, it enters to a greater or less extent into the composition of nearly all natural substances. Thus, for example, some vegetables, like cabbage or celery, contain as much as ninety-five per cent. of water; and, on the other hand, close-grained marble may contain as much as four per cent. of water, or almost a quart to the cubic yard. On account of its remarkable solvent powers, which enable it to take up a smaller or larger quantity of nearly every substance with which it comes in contact, water is never found pure in a natural state; and, indeed, absolutely pure water for chemical purposes can only be obtained by repeated careful distillations.

Air and Gases in Water.—A considerable amount of air generally exists in water, and is taken up by the gills of fishes, assisting them to accomplish the proper aeration, or rather oxygenation, of their blood. The air usually mingled with water may be expelled by boiling, but is absorbed again if the boiled water is agitated with access of the atmosphere.

Boiled Water.—The insipid taste of water which has been boiled is due to the absence of air. Many gases besides air may be artifically or naturally mingled with water, and some, like ammonia or nitric acid, are freely soluble in it. In sea-water, the presence of common salt, with small quantities of sulphate of soda or Glauber's salt, and, of the compound of magnesia and chlorine, called chloride of magnesium, render it entirely unfit for drinking, as many a hapless shipwrecked sailor has found to his cost.

Distilled Water.—At the present day, most sea-going vessels are provided with apparatus for distilling the water of the ocean, and so producing a pure and wholesome but insipid water, which can be rendered, however, more palatable by agitation with plenty of fresh air. Hence, the horrible agony of death by thirst among sailors is now much less frequent than formerly, although mariners in open boats, or cast upon small, uninhabited islands, still sometimes scan with anxious eyes the briny waste around them, beholding—

> "Water, water everywhere, but not a drop to drink."

Sea-Water.—Sea-water varies considerably in composition, being, of course, more concentrated, as a rule, in the tropical regions, where evaporation is most active, such, for example, as in the Mediterranean Sea and the Atlantic Ocean near the equator. According to analysis, the water in the English Channel contains in 1000 parts—

Chloride of Sodium	28.05
Chloride of Magnesium	3.66
Sulphate of Magnesia	2.29
Sulphate of Lime	1.40
Other Saline Materials	.76
Total Solid Matter	36.16

Besides these, and perhaps contributing largely to the healthful qualities of sea-water, there exist in the ocean small quantities of iodine and bromide, and extremely minute amounts of some of the common metals. It has been found that, by dissolving a little common salt and carbonate of soda, lime and magnesia in distilled sea-water, its taste is rendered much more agreeable; and this plan, it is said, is adopted in the Russian navy.

Temperature of Sea-Water.—The temperature of the water of the ocean is much less easily influenced by the heat of the sun's rays than the air which floats above it. Thus, for example, between the tropics, where the summer-air temperature may attain a height of 130 degrees or 140 degrees in the noonday sun, the temperature of the ocean rarely rises above 80 degrees Fahrenheit. At a distance from the coast, in temperate climates, the temperature of the sea does not vary more than about 20 degrees—being about 50 degrees in winter and 70 degrees in summer. This equability of the ocean temperature has a very important modifying effect upon the climate of maritime countries, rendering them cooler in summer and warmer in winter, thus often favorably influencing the health of the inhabitants. In some islands, as for instance in Madeira and others of these little islands, the thermometer has not, it is said, fallen below 60 degrees, or ascended above 80 degrees, from one year's end to another.

Purity of Rain-Water.—The water, which rises in vapor into the atmosphere from all the oceans, seas, lakes and rivers of the globe is condensed after a longer or shorter time, and falls to the earth again as rain. Rain-water, being in reality a distilled fluid, is the nearest approach to a pure water which we find in nature, and when caught in clean vessels placed upon elevated objects is almost free from contamination.

Impurities in Rain-Water.—It contains, however, small quantities of organic matter, nitric acid and ammonia, all of which are washed out of the air through which it descends as rain. The source of the nitric acid is believed to be the nitrogen of the atmosphere, which combines with oxygen under the influence of the electric spark during thunder-storms. Nitric acid in rain-water exists in such insignificant amount as to be entirely unimportant in itself; but it adds very seriously to the danger of impregnation with lead from lead pipes, roofs and cisterns by rapidly dissolving that metal and forming the very soluble and highly poisonous salt, nitrate of lead.

SOURCES OF DRINKING WATER.

Evaporation.—Our supplies of drinking water are, of course, derived originally entirely from the rainfall. We need not consider now how the water found it way into the air. Without entering into the details of the process of evaporation, all that the present object requires is, that we clearly recognize the fact that spring, fountain, river and lake are all alike fed from the clouds which float over our heads and send their rain upon the just and upon the unjust. Hence, then, man is wholly dependent for his supply of this vital element upon the rain which comes down from heaven. He may dwell upon the most arid plains, but he drinks from the stream which flows beside or underneath his feet—which stream is itself fed by floods that fell perhaps a thousand miles away—and whatever mystery attaches to subterranean waters, we may be sure that, by a long enough circuit, we can trace every drop back to the clouds.

Various Fortunes of Rain.—The rain which falls upon the face of the earth meets with various fortunes. A part of it—the storm-water, which furnishes most of our drinking fluid—washes the surface of the ground, carries away from it in suspension many of its finely-divided particles, dissolves what it finds easily soluble along its path, is gathered into open drainage channels and, forming part of some river system, hastens to the sea. It touches geological problems at every inch of its way, some of which will be referred to briefly when speaking of soil and climate in their relations to human health.

VARIETIES OF WATER.

Rain-Water.—In classifying waters, we have first to consider them as regards their sources. Rain-water, as already mentioned, is sweet and soft, and when filtered is perfectly adapted to all the purposes of life; the one difficulty about its use being the impossibility of collecting it pure and preserving it without contamination for the long periods of time and in the large quantities which would often be necessary.

Spring- and Well-Water.—Spring- and well-waters are almost always more or less impregnated with the soluble ingredients of the earth and rocks through which they pass, and are therefore sometimes very unsuitable

Polluted Well-Water.

for the ordinary wants of life. As a general rule, they are colder than other waters, although hot springs are found in various parts of the world, some with a temperature as high as the boiling point.

Mineral Springs.—Mineral springs, notwithstanding they are much used for drinking, are properly medicinal agents. They comprise all those waters which contain sufficient quantities of dissolved matters, such, for example, as iron or sulphur, as to produce thereby a positive effect upon the systems of persons partaking of them. The mineral springs of this country are frequently valuable remedial agents in some chronic diseases.

River-Water.—River-water is, to a certain extent, similar to spring-water, but is much more apt to be contaminated with sand and clay, organic material from decomposing vegetable or animal remains, the refuse of manufactories, and especially with the sewage of cities and towns, to which it is probable immense amounts of sickness and death are annually due in all civilized countries. Unfortunately, river-water is that which is chiefly supplied to towns and cities, and therefore finds its way into the systems of vast numbers of our fellow-beings.

Stagnant Water.—Stagnant water is, from the large quantity of organic matter in a decomposing state which it holds in suspension or solution, exceedingly unfitted for drinking and culinary purposes, no matter how transparent it may appear; and it should, in consequence, be carefully avoided whenever running water can possibly be procured. Pond-water, canal-water, ditch-water and marsh-water all come under this category, and should be scrupulously shunned, under penalty of suffering from fever and ague, dysentery, typhoid fever, and many other dangerous maladies.

Another Classification of Waters.—Some authors upon hygiene further arrange the different kinds of water into three groups, according to the various uses to which they are applied. The first of these comprises the drinking waters, including the mineral waters, which, though medicinal, are chiefly so by being taken into the stomach; second, the washing waters, and third, the bathing waters, under which head the waters of the ocean are entitled, from a sanitary point of view, to a prominent place. A very important consideration in regard to water-supply, whether it be for a single family or for a large community, is, next after its purity, its abundance. Many instances are on record where, after comparatively expensive water-works had been constructed, it was found that the amount of water obtained was insufficient, and new arrangements must be made.

Quantity of Water Needed.—The quantity of water needed by man and animals must therefore be very carefully calculated. Repeated experiments upon a very extended scale in England have shown that a healthy man requires daily as drink from two to four pints of water, this amount being in addition to that which is swallowed as moisture in food. The amount required for cooking is estimated at from half a gallon to a gallon or more. To this quantity, Dr. Parkes considers should be added for daily ablution, including a sponge bath, five gallons; daily share of kitchen and other utensils, and house washing, three gallons; and share of clothes washing, another three gallons; making up a total of a little over twelve gallons for each individual daily. In the poorer districts of the city of London, the amount used is stated to be only about five gallons daily. A shower-bath will require about four gallons extra, and a plunge-bath from forty to sixty gallons. Where water-closets are used an additional quantity of from four to six gallons daily for each person must be provided.

Water Supply for Cities.—Professor Rankine estimates that the average daily allowance for each individual in large towns should be ten gallons for domestic purposes, such as those already enumerated; ten gallons for municipal purposes, such as washing streets, extinguishing fires and so forth, and ten gallons more for trade purposes, at least in manufacturing communities. This total of thirty gallons per head, large as it may seem at first sight, is actually furnished to many towns at the present time. Thus, for example, the amount furnished daily to each individual in Paris is thirty-one gallons, and the different London water companies supply from twenty-one to thirty-four gallons daily per head to the entire population.

Supply in American Cities.—In American cities the item of waste enters largely into the account, so that much greater quantities are theoretically furnished. For instance, in Washington 138 gallons, and in New York about 100 gallons, are supplied daily for each inhabitant. In large towns and cities, especially with the combustible buildings so common in the United States, the source of supply must be capable of furnishing a quantity, in case of extensive fires, vastly in excess of the average consumption. In the great fire of Boston, in 1872, when about sixty acres in the business portion of the city was involved in the burned district, whilst the daily consumption of water was a little over 12,000,000 of gallons, nearly 17,000,000 of gallons are thought to have been used.

Waste of Water.—The amount of waste is so great that, according to the report of the Chicago public works, one-half of the water pumped is wasted, and the cost to the city of wasted water in St. Louis was estimated at $4,000,000 in ten years. In some cases an attempt has been made to diminish the necessity for a very large amount of pure water by having two sets of pipes and introducing two kinds of water, one pure enough for drinking and culinary purposes, and the other suited to the less delicate uses, such as most of the municipal and trade purposes. But, in addition to the seriously increased expense of such a double system, it is found in practice that the purer water is generally employed for nearly all purposes, and little saving is therefore accomplished.

Method of Supply.—In England, and on the continent of Europe, there are many places where the water-supply is only let into the distributing pipes of a certain section of a town, for example, during a few hours each day, and then turned off and transmitted to another part for another short period. This is called the intermittent supply system; but it has so many disadvantages, prominent among which is the entrance of foul air and organic matters into the empty pipes, whilst they are not in use for delivering the water, that it has seldom been adopted in this country, and is stated to have fallen into disfavor abroad.

DISEASES FROM MINERAL IMPURITIES IN WATER.

Purifying Ingredients.—Since all river-, spring- and well-waters contain a certain amount of dissolved matters, taken up from the soil through and over which they pass, it becomes a very important consideration to determine what these ingredients are in any particular sample of water, and also the kind and degree of such impurity which will not prove injurious to health. Dr. Letheby, from investigations made in sixty-five English and Scotch towns, arrived at the conclusion that from five to twenty grains to the gallon of the compounds of lime and magnesia are necessary to render drinking water in the highest degree wholesome.

Saline Impurity.—But any quantity of saline impurity exceeding thirty-five grains to the gallon renders a water unfitted for the freest domestic use. Such water would be popularly designated as a very "hard" water, but a good deal of difference is caused by the nature of the hardness, that due to sulphate of lime, and called the permanent hardness because it is not removable by boiling, being decidedly most prejudicial to health.

Diseases Caused by Alkaline Waters.—The symptoms referable to an excess of alkalinity, arising from the presence of these earthy salts in a drinking water, are mainly those of a dyspeptic nature. At first the employment of hard water by persons who are unaccustomed to it produces diarrhœa, which is occasionally serious or even dangerous in its character. But the long-continued use of such a drinking fluid is thought to cause habitual constipation, with the heavy train of evils, including piles and liver complaint, which depend upon it. Calculus, or stone in the kidney or in the bladder, which gives rise sometimes to the most horrible agony human beings are ever called upon to endure, is believed to be due, in many instances, to an excess of lime and magnesian salts in the drinking water.

Cause of Goitre.—The swelling of the thyroid gland in the neck, producing the repulsive deformity of goitre, or Derbyshire neck, seems to be intimately connected with mineral impurities in water. In Nottingham, England, where this disease is not unfrequently met with, the common people attribute it to the hardness of the water, and other parts of Great Britain it is found to prevail only, or at least especially, in those districts where the magnesian limestone formation abounds.

Goitre in Switzerland.—Dr. Coindet, of Geneva, Switzerland, asserts that Goitre is speedily produced in persons who drink the hard pump-water in the lower part of that town, whilst in other parts of Swizerland the use of spring-water has been followed by the development or augmentation of goitre in a very few days. In India also it has been shown conclusively to prevail, to any marked extent, only where the magnesian limestone rocks underlie the soil; but whether it is the lime and magnesian salts, or whether, as has been suggested, it is the presence of sulphide of iron in the bed-rock formation, which is the direct cause of the development of Goitre, has not yet been positively determined. It appears certain, however, that Goitre is originated by some water impurity, and that this contamination is of an inorganic and not of an animal or vegetable nature.

Organic Impurities in Water.—A small quantity of organic matter of vegetable origin, that is to say, an amount not exceeding three grains to the gallon, is not generally found to be injurious, but even very minute quantities of organic material *of animal origin*, especially if this material is composed of the waste matters, such as urine or excrement, from man or animals, is the great cause of unwholesomeness of water. Probably one-fourth of the sickness and death in civilized communities arises directly or indirectly from this one cause, and, unfortunately, even when we are fully forewarned of this imminent danger to health, it is exceedingly difficult, in most thickly populated places, to secure a source of water-supply with which sewage has not been mingled.

Impurity of Western Rivers.—The earthy and organic matters which are so abundant in the river-waters of many of our Western States, almost invariably produce diarrhœa in those who are unaccustomed to their use; though this complaint gradually ceases to manifest itself in most cases if the drinking of such water is persisted in. The water of the Mississippi, the Missouri, the Kansas and the Rio Grande has frequently been found to give rise to severe diarrhœa, continuing for several weeks, and occasionally terminating in ulceration of the bowels and death. Even in persons who can under ordinary circumstances drink the waters of these rivers with impunity, frequent intestinal discharges are produced when floods, such as has recently been experienced in Cincinnati, have caused an unusually increased amount of earthy and organic matter to be carried along in suspension, from the head waters of the tributary streams, and from the overflowed banks.

Effect of Metallic Impurities.—The effects of minute traces of metallic substances in drinking water have not yet been ascertained with sufficient accuracy, but it is quite possible that the entire sanitary condition of a district may depend in some measure upon impurities of this description. Mr. Wanklyn suggests that the well-known salutary effect of what is called change of air may be, in reality, partly due to the escape from some extremely small metallic impurity in the water of the section of country from which removal takes place.

Cause for Bright's Disease.—It has long seemed probable that the increasing prevalence of that terribly fatal malady, "Bright's disease," especially in cities and large towns, may be due to the poisonous effects of exceedingly minute quantities of lead, dissolved from the lead pipes so generally employed as service-conduits, notwithstanding the protective coating which usually forms so promptly upon them.

Lead Poison in Water.—These are probably very common throughout our whole country, and, contrary to what at first sight might be imagined, it is likely that lead much more frequently and seriously affects the health of people inhabiting small villages and country houses, than that of residents in cities, notwithstanding the latter constantly use water which is brought into their houses through long lines of lead service-pipes. The explanation of this seeming paradox is that river-water, which is that usually supplied to citizens, contains in almost all cases a small amount of the sulphate of lime, sulphate of magnesia, or some other compound of sulphuric acid, which, when brought in contact with the lead pipes, is decomposed, and the resulting sulphate of lead which is formed has the happy faculty of clinging to the inside of the pipes where it is produced, and thus constituting an insoluble lining, which not only protects the tube from further corrosion, but also, what is of far greater importance from a sanitary point of view, prevents any further contamination of the drinking water which flows through the conduit.

Lead Poison in Rural Districts.—In rural districts, on the other hand, wherever rain-water is used for drinking purposes, it is exceedingly liable to be contaminated with lead from lead-lined cisterns, lead service- or collection-pipes, lead roofs, or from the solder of tin roofs. As a rule, the purer the rain-water, the greater is its action on lead with which it stands in contact; hence, therefore, the presence of a minute quantity of some salt of sulphuric acid in water is of a very great importance, and serves as an invaluable protection against lead-poisoning to the human beings and animals who may employ it for drinking purposes.

How Lead Poisons Water.—When pure water recently boiled is placed in, or run over, lead, no action takes place; but if the water, after being boiled, is exposed for a short time to the air, from which it absorbs oxygen and carbonic acid, and is then brought in contact with lead, we soon find that a whitish film, which on chemical examination is found to be composed of the carbonate of lead, is formed upon the metallic surface. This whitish film, which easily separates from the lead on which it appears, and becomes mechanically mixed with the water, is very poisonous. Since, as already mentioned, rain-water contains usually some nitric acid, in addition to the oxygen and carbonic acid which it absorbs from the air, and this nitric acid combines with lead to form a very soluble and poisonous nitrate of lead, it is much more dangerous than even pure aerated water, after standing for a short time in contact with a leaden surface. Rain-water intended for drinking or cooking purposes ought therefore never to be collected from lead or tin roofs, transmitted through lead pipes, nor under any circumstances stored in lead-lined cisterns of any kind.

Virulence of Lead Poison.—In the celebrated case of the accidental poisoning of the ex-royal family of France, at Claremont, by lead which was taken up in the drinking water, the amount was found not to exceed one grain of the metal to the gallon of water. From cases which have since been observed, it would appear that the habitual use of water containing one-tenth or even one-twentieth of a grain per gallon, is sometimes attended with danger. In his investigation into the cause of that curious disease, as it was formerly considered, the Devonshire colic, Sir George Baker, who discovered that it was only a form of lead-poisoning due to the drinking of cider fermented in lead-lined vats and troughs, found that eighteen bottles of cider he examined contained four and a half grains of lead, or a quarter of a grain to each bottle.

Lead Palsy.—Under some special circumstances, not at present well understood, extremely minute amounts of lead in water may prove injurious. Thus, for example, Dr. Angus Smith speaks of cases in which lead-paralysis, or palsy, was apparently produced by water containing only one one-hundredth of a grain of lead to the gallon.

Detection of Lead in Water.—The method of detecting the probable presence of lead in a sample of drinking water is so simple that every reader is advised to take the first opportunity of examining their own water-supplies, and so making sure that they or their families are not liable to the insidious dangers of lead-poisoning. In order to determine whether a water is contaminated with lead, all one has to do is to drop two or three drops of the solution of sulphide of ammonium into the suspected fluid, contained in a white bowl or large cup, and observe whether a brownish or yellowish coloration is produced. If the liquid remains perfectly clear and colorless you may be sure that it either contains no lead, or that such a metallic impurity is present in a quantity of less than one-tenth of a grain to the gallon, an amount which is not generally injurious to health. If, however, a slight brownish tint is produced in the water which is being tested, it must not be too hastily condemned as poisonous, since either copper or iron might give rise to the same coloration with the reagent. Such a suspicious water ought, however, to be promptly analyzed by some good analytical chemist before being employed for either cooking or drinking purposes any further.

Applying the Test for Lead.—The sulphide of ammonium may be purchased at a small cost, say for twenty-five cents an ounce, of most dealers in chemicals; and, as its odor is extremely disagreeable, it should be kept carefully corked until the moment it is used. The experiment should be made upon about half a pint of the suspected water; and, if the contamination is supposed to be caused by lead pipes, it is a good plan to test a portion of the liquid which has stood over night in the conduits. The mode of discriminating the precipitate caused by iron from those due to the dangerous metals, lead and copper, is to let fall a few drops of hydrochloric acid, called also muriatic acid, into the fluid. If the brownish or yellowish-brown tint disappears, we may know that innocent iron is the only metallic impurity; whilst if, on the contrary, no change is effected by the addition of the acid, one of the poisonous metals, lead or copper, is present. No water, however, in which the slightest tinge is produced by adding the sulphide of ammonium, should be swallowed by man or beast until a rigid investigation by a competent water-analyist has proved it to be harmless.

Difficulty of Obviating Lead Poison.—Attempts have been made to obviate the danger of water contamination from lead pipes in various ways, but not as yet with complete success. In some instances the pipes have been lined with other metals, such as tin or zinc; but, at least in some instances, a galvanic action has thus been set up, which corroded the conduits with great rapidity, and probably led, therefore, to still more dangerous pollution of the water supply. Coating the pipes on the inside with coal-tar, bituminous varnish, solution of gutta-percha and of India-rubber, have also been experimented with, as yet with but partial success.

Lead Diseases.—The injurious effects of lead upon the human system are displayed first, in the production of dyspepsia; later, obstinate constipation and a peculiar kind of colic, so common among painters from the influence of lead that it has received the name of "painter's colic;" and finally, disturbance of the nervous system, especially that peculiar form of lead-palsy called wrist-drop, in which the power to lift up the hand is more or less completely lost.

Iron in Water.—The presence of iron in a water, rendering it what is called Chalybeate, from the old Greek name for iron, renders it to many persons only a useful tonic, but in some people it causes severe headache and serious disturbance of the digestive organs.

Arsenic in Water.—Arsenic, copper and mercury are rarely found in drinking waters in America, except in streams flowing near chemical works, or unless they are introduced designedly with some murderous intention. These metals may therefore be practically ignored in the consideration of water from a hygienic point of view.

Infectious Diseases from Impure Water.—The principal acute diseases which are due to impure water are Cholera, Typhoid Fever, Diarrhœa and Dysentery; and, although it is only within a comparatively recent period that mankind has begun to realize its dangers from this source of these maladies, the accumulated evidence is already very conclusive.

Cholera Due to Impure Water.—Among the remarkable outbreaks which go to prove that this mode of cholera propagation is not at all uncommon, may be mentioned the following, condensed from Mr. Simons' eighth report as medical officer of the English privy council, during the prevalence of cholera in England in 1865: A gentleman and his wife from the village of Theydon-Bois, in Essex, had been lodging at the town of Weymouth for two or three weeks, and returned home towards the end of September. On their way home they passed through Dorchester, where the gentleman was seized with diarrhœa, vomiting and cramps, which continued more or less during the next day and the day following, when he reached his own home. During the journey the wife also began to complain of pain in the abdomen, which was followed by diarrhœa and eventually by cholera, from which she died.

Cholera Infection.—A few days after their return the same terrible disease rapidly attacked other members of the household, so that, within a fortnight, in that one little circle, eleven persons had been seized with cholera, including the mother, father, grandmother, two daughters, son, doctor, serving-lad, serving-maid, laborer and country-woman, and of these eleven only three survived, namely, the son, a daughter and the serving-lad. Later, in the country-woman's family, there was another fatal case. It cannot well be doubted, concludes Mr. Simon, but that the exciting cause of this succession of events was in some way or other the return of the parents from Weymouth—of the father with the remains of choleraic diarrhœa upon him, of the mother with apparently the beginnings of the same complaint. But this is only part of the case, and the remainder teaches a most impressive lesson. All the drinking water used in the house came from a well beneath the floor of the scullery, and into that well there was habitual soakage from the water-closet.

Another Case of Infection.—Another famous illustration is found in the history of the "tea-water pump" of Broad street, near Golden Square, London, which, during the cholera visitation of 1854, killed nearly 500 persons in a single week, in one of the fashionable localities of the city. It has long been known that water containing five or six grains of lime and magnesia to the gallon is much to be preferred for making tea to water of any other quality. This is because the lime precipitates the astringent matter of the leaf, yet does not interfere with the solution of the desirable constituents; and hence certain wells which have this proper proportion of mineral matter come to be valued very highly by persons of nice taste.

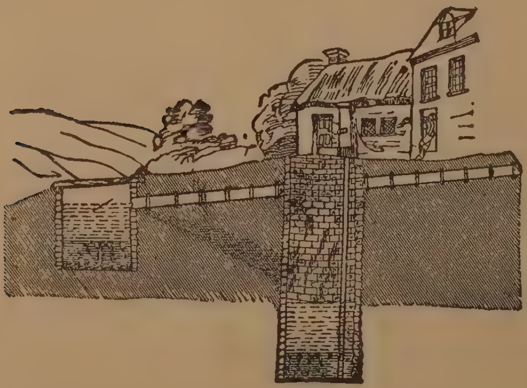
The Famous London Pump.—At any rate, the Broad street pump had in London the reputation of furnishing, in its cold and sparkling waters, a better medium for "the cup which cheers but does not inebriate," than was elsewhere to be found. When the cholera invaded this neighborhood the wealthy residents retired to the fashionable suburbs which were still uninfected; but, to the surprise of many, the cholera broke out among them with terrible severity. The health officers soon discovered, however, that those who were attacked had sent in every day to their favorite Broad street pump for their water-supply, and, by removing the pump-handle, they quickly put an end to the epidemic.

A Remarkable Incident.—One incident connected with this outbreak was very remarkable: A wealthy spinster, who was not so tired of life as to remain quietly in the path of the pestilence when it approached, withdrew to a suburb called Hampstead. But her tea was particularly dear to her, and every day her serving-maid was sent three miles to the Broad street pump for a kettle of tea-water, and this spinster and her maid were the only persons attacked with cholera in Hampstead.

Avoiding Cholera.—A first and highly important warning, therefore, which these and many other similar occurrences give us is never to drink any water which, by any possibility, could have become contaminated with the smallest particle of discharge from the bowels of a person suffering from cholera or choleraic diarrhœa.

Typhoid Fever from Polluted Water.—The remarks which have been already made with regard to the influence of impure water on the spread of cholera, apply with still greater force to the causation of typhoid fever. So common is this mode of propagation that the assertion may be ventured that few readers of these pages have not lost some near relative or beloved friend from this dreaded disease arising in this way, although the true source of the infection was perhaps, at the time it occurred, quite unsuspected.

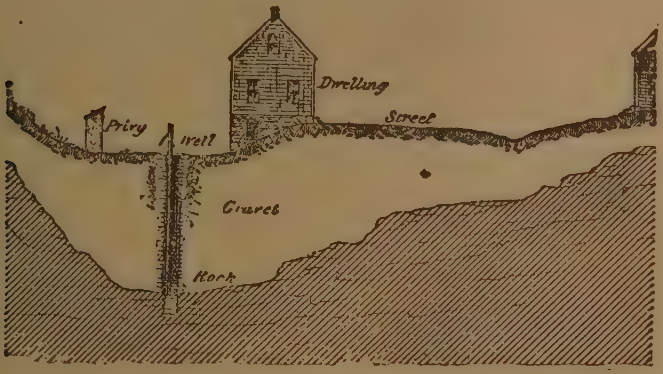
Spread of Typhoid.—Sir William Jenner, than whom no higher medical authority could well be quoted, in commenting upon this point, says: The spread of typhoid fever is, if possible, less disputable than the spread of cholera by the same means; solitary cases, outbreaks confined to single houses, to small villages and to parts of large towns, cases isolated it seems from all sources of fallacy, and epidemics affecting the inhabitants of large though limited localities, have all united to support, by their testimony, the truth of the opinion that the admixture of a trace of excrement, but especially of excrement from a typhoid-fever patient, with the water supplied for drinking purposes, is the most efficient cause of the spread of the disease, and that the diffusion of the malady in any given locality is limited or otherwise, and limited just in proportion as the dwellers in that locality derive their supply of drinking water from polluted sources.



Poison from Leaky Drains.—In the adjoined cut is shown how putrefying animal matters from a leaky drain and an overflowing cess-pool soak diagonally into the well and contaminate the well-water, which is pumped up and used by the family without, perhaps, a thought of danger from this terrible sanitary defect.

Deadly Effect of Water Impurity.—According to the late Dr. William Budd, it also appears to be highly probable that, when the poison of typhoid fever enters the system by drinking water, infection is much more certain than when it is disseminated by the air and is breathed into the lungs. In support of this statement, he instances an outbreak which occurred in Wales, where out of ninety or a hundred persons who attended a ball, fully one-third was shortly afterwards laid up with fever. Although the water was not examined, there was satisfactory reason to believe that it was polluted with sewage.

Typhoid Poison from a Well.—In the report of the American Public Health Association for 1873, Dr. Austin Flint gives an account of an outbreak of typhoid fever in Vermont which it was possible to trace, in the most circumstantial way, to the poisoning of a well in some such method as has been described. A young man traveling through that region by stage-coach was taken ill, and, when he could go no further, was left at a tavern in a little hamlet to be cared for, his illness soon proved to be typhoid fever. A small watercourse, in a shallow valley, divided the village into two portions, each of which consisted of half a dozen houses or less. In a few days new cases of the fever made their appearance in that part of the hamlet to which the tavern belonged—every house, in fact, but *one* was invaded with this disease—whilst on the other side of the stream not a case occurred. It appears that the tavern well, which was the only one upon that side of the village, furnished the water-supply to all the families belonging there *but one*. That one family



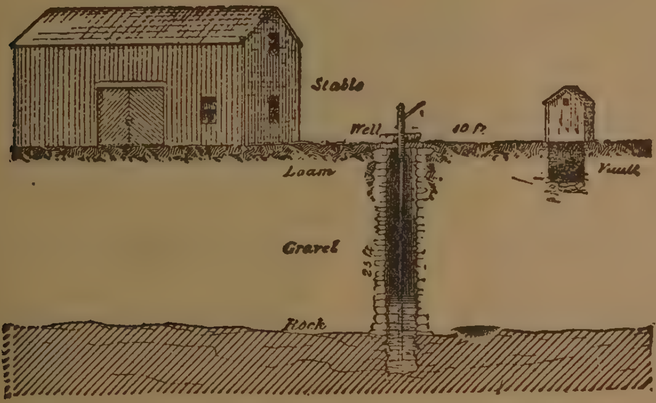
had had a quarrel with the landlord of the hotel, had consequently deserted the tavern well for a more distant supply of drinking water, and so escaped swallowing the specific poison of typhoid fever in the water by which all their neighbors were stricken down.

An Impressive Lesson.—The above diagram teaches a most impressive lesson. It represents the relative positions of the well and privy of a house in Lynn, Mass., with a view of the general arrangement of the bedrock upon which the foundation layer of porous gravel rested. Five cases of typhoid fever occurred in this house during the year 1875, and seven more cases of the same disease, with one death, among other persons who used the water. Hence this well, like that of the Vermont tavern-keeper, became the centre of infection of typhoid fever for the whole neighborhood.

Sanitary Well-Digging.—In such instances as this, there is no manner of doubt that the well-water becomes contaminated by the washing or soaking through the ground from cess-pits or other receptacles for the evacuation from the bowels of diseased human beings. Direct experiment has proved that, in a light, porous soil, a well eighty feet deep will drain a portion of earth in the shape of an inverted cone, the point of which is at the bottom of the well, and the base of which is on the surface of the ground, where it has a diameter of about 600 feet, or nearly eight times the depth of the well, and so in proportion for shallower wells. Hence if, in the centre of a large village building-lot, 150 feet square, is dug the well of forty feet deep, for supplying the mansion with water, and at any one of the corners of the yard, as far distant as possible, is sunk a more or less shallow pit to serve as a cess-pool, the chance of contaminating the first pit with rainwater washings from the second pit or cess-pool is very great, and the danger of infecting the whole family with cholera, typhoid fever and probably other maladies, should a single case of these diseases find access to the grounds, imminent.

Danger in Farm-Houses from Polluted Water.—Of course, the same conclusion holds good for country farm-houses or dwellings when, from motives of convenience, although there is space enough and to spare, but a short distance is interposed between the sides of the hole which is called the well, and which furnishes the drinking water, and the other hole near by which is called the cess-pit, and used as a receptacle for filthy, often poisonous, excrement. Moreover, there are no doubt many instances where, owing to the inclination of beds of sand or gravel, strata of rock and so forth, impurities of these and other dangerous varieties may be carried, by underground currents, much further than the distance which have been mentioned as measured upon the surface of the earth. In other words, a cess-pool on a hill-side, 500 feet or more away from a well, may infect the water of the latter, if underground currents favor such contamination.

Foul Wells and Graveyards.—Practically, it is beyond all question that, in multitudes of instances throughout the United States, the *cess-pits feed the wells*, and it is equally certain that *such wells feed the graveyards*, of villages and districts where so glaring and culpable neglect of hygienic precaution is allowed to occur. In this connection it cannot be too strongly impressed upon my readers that the filtration of water through the earth, even though sufficient to remove all visible impurities, does not necessarily render it safe and fit for use; that is to say, clear water is not necessarily pure water, any more than cold air is necessarily pure air.



Cess-Pool Poisons.—The accompanying illustration forcibly depicts the danger so much insisted on from the contents of cess-pools soaking diagonally through the soil. The well here represented was twenty-five feet deep, a portion being sunk into the bed-rock. The vault of the privy was only ten feet distant, and there was also a cess-pool in the garden below, and a stable close at hand on the left. The water was clear and of good taste, and had been used for many years; but the occurrence of typhoid fever in the house, to which these premises were attached, aroused suspicion, and on examination it was found to be largely contaminated with dangerous organic matter, doubtless from the vault, cess-pool and stable. Five cases of typhoid fever occurred in the family living upon this property, and several more cases, with one death, among the neighbors using the well-water. Here the water was drank habitually for years by a score or more of people without apparent injury, until the fall of 1876, when it doubtless became polluted with the germs of typhoid fever from some pre-existing case of that disease, perhaps by some such mode as that described by Professor Austin Flint, and already referred to a few pages back.

Diarrhœa and Dysentery from Impure Water.—The instances of outbreaks of these two diseases from contaminated water-supply are very numerous, and probably most of persons can recall examples of this kind. The impurities which produce diarrhœa and dysentery are suspended earthy matters, such as are found in most river-waters after a rain; suspended animal and vegetable material; sulphates and chlorides of lime and magnesia, and nitrates of ammonia and of lime. Besides the numerous outbreaks traceable to direct sewage contamination, there are several instances recorded of indirect poisoning of a water-supply from this source, as in the following curious case.

Outbreak at Salford Jail.—In the Salford, England, jail there was a sudden outbreak of diarrhœ of a choleraic type, which affected more than half of the prisoners; while of the officers and their families, who were distributed throughout the building, not one was attacked. The food of the convicts was examined and found to be good; it was evident, also, that the air did not contain the cause of the disease, because both classes above mentioned were under the same conditions in that respect. Suspicion was therefore directed to the drinking-water. It was then discovered that, though the water supplying all parts of the prison was derived from the same source, there was one cistern for the use of the officers, and another covered cistern for furnishing to the prisoners their allowance, and that the untrapped overflow-pipe of the latter communicated with an open sewer. On the day of the outbreak of diarrhœa in the jail, the water from this cistern was observed to be colored and to taste unpleasantly.

Sewer-Gas Poison.—It had obviously absorbed sewer gas, which had ascended through the overflow-pipe, and that this had been the real cause of the disease was indicated by the fact that the diarrhœa disappeared almost as rapidly as it had broken out, when the cistern was emptied and the pipe efficiently trapped.

Diarrhœa in Country Districts.—Dr. Wilson declares that, according to his experience, much of the diarrhœa which prevails in country districts during the summer and autumn amongst children is due to polluted water, drank either as it is drawn from the well or when mixed with milk, fraudulently or by accident.

Fluxes from Impure Water.—An old author mentions as a curious fact, which is highly suggestive to us at the present day as well, that ship's crews, when ordered to Tortola, in the West Indies, were invariably seized with fluxes caused by the water; but the inhabitants who used tank-, that is rain-water, were free from the diarrhœa, and so well was this known that, when any resident of Tortola was invited to dinner on board of a man-of-war it was no unusual thing for him to carry his drinking water with him.

Impure Ice as a Cause of Diarrhœa.—The fact that ice is now used by almost all classes to an extent which entitles it to rank rather as a necessity than, as formerly, as a luxury of life, renders it important that its purity should be as jealously guarded as the water-supply. It is popularly believed that water frees itself from dangerous organic matter, as it does to a great degree from certain saline contaminations during the process of freezing, and also that the vegetable or animal germs of typhoid and other fevers are killed, or at least rendered sterile, by congelation of the water in which they exist. Both these ideas are, however, unquestionably erroneous, as has been repeatedly proved by the various experiments which ignorant hotel-keepers try without the least intending it, upon their guests, on a scale which would make the boldest vivisector stand aghast before the suffering inflicted, even if it were only upon the brutes which form the subjects of his researches.

A Case of Impure Ice Poison.—Such was notably the case in an epidemic of intestinal disorder which occurred at the watering-place of Rye Beach, N. H., in 1876. From the account of Dr. Nichols, who attended most of the patients, it seems that, early in the season, a mild form of disturbance of the stomach and bowels made its appearance among the guests of a particular hotel at this favorite summer resort. The symptoms were in general giddiness, nausea or vomiting, diarrhœa and severe abdominal pain, accompanied by fever, loss of appetite and mental depression. The well and drainage system of the establishment, which had recently been put in complete order, was found almost faultless, and the milk-supply of unquestionable purity; but on the attention of the physician being directed to the stock of ice provided for the guests, conclusive proof of its dangerous quality was promptly obtained.

The Contaminated Ice Pond.—Both the house in which the ice was stored and the water from the melted ice gave off a decidedly disagreeable or even offensive odor. Finally, a visit to the pond from which the ice had been gathered disclosed the fact that much of the water in it was dark-colored, foul and highly contaminated with filthy marsh-mud and decomposing saw-dust. Chemical analysis showed that both it and the suspected ice contained a large excess of organic and volatile impurities, including four one-hundredths of a grain per gallon of albuminoid ammonia.

The Conclusive Test.—The conclusive test, however, of injurious quality pertaining to this ice was afforded by its disuse in the hotel, coincident with which was noticed an abrupt improvement of the symptoms in all who had previously been ill, and the entire absence, so far as known, of any new cases.

Yellow Fever Germs in Ice.—In Connecticut, the Board of Health informs us that, in several instances, attention has been drawn to sewage-contaminated ponds with ice-houses upon their borders, and that several isolated cases of typhoid fever, and one death, from the free use of ice polluted by sewage, had been recorded in that State during 1879. The curious natural experiment of the United States steamship Plymouth, elsewhere detailed, shows conclusively that the germs of yellow fever are not infallibly destroyed by a freezing, probably not by a zero temperature, and contributes its share of proof that impure ice, especially when gathered from ponds polluted by sewage, may constitute a prolific cause of disease.

Dangers in Snow-Water.—Snow-water, pure and fresh as it seems whilst flowing in the sparkling streams which descend snow-capped mountains in our Western States, may be very dangerous to health in consequence of organic impurities contained in it. Mountaineers, to whose long observation and experience in the wilds some attention is due, attribute the origin of the so-called mountain fever to the melting of snows and the drinking of snow-water.

Mountain Fever Due to Snow-Water.—This disease is apt to prevail in the Rocky Mountains in the spring, that is, during May and June, when the ice in the streams breaks up and the snow commences melting. In one instance, out of a party of 367 officers and men, 110 were affected with mountain fever in a few weeks after commencing to drink snow-water, which is described by the medical officer attached to the expedition as being cold, clear and perfectly free from the alkaline taste generally found in waters of that region.

Ague from Impure Water.—Although the poison of fever and ague is probably, as a general rule, conveyed into the human system by being breathed into the lungs, some cases seem to show that it may also enter the body by drinking water.

Diarrhœa Outbreaks from Impure Water.—As general conclusions in regard to contaminated water, it may be stated that: 1st. An outbreak of diarrhœa arising in a community is almost always owing to impure air, impure water, or bad food. If it affects a number of persons suddenly it is probably due to one of the last two causes, and if it extends over many families, almost certainly to water. But, as the cause of impurity may be transient, it is not always easy to find experimental proof.

Dysentery Outbreaks from Impure Water.—2d. Diarrhœa or dysentery constantly affecting a community, or returning periodically at certain times of the year, is far more likely to be produced by bad water than by any other cause.

Cholera Outbreaks from Impure Water.—3d. A very sudden and localized outbreak of either typhoid fever or cholera is almost certainly owing to the introduction of the poison by water.

Malarial Outbreaks from Impure Water.—4th. The same statemen is true in cases of ague or malarious fever; and, especially if the attacks are serious, a possible introduction by foul water should be carefully inquired into.

Diphtheria Outbreaks.—5th. Where diphtheria proves particularly fatal and carries off several members of a family there is always reason to suspect contamination of the water-supply, which should be remedied as quickly as possible for the sake of the survivors.

Worms from Impure Water.—6th. The introduction of the eggs of some of the intestinal worms, by means of drinking water, is proved in some instances and rendered highly probable in many others. People residing in districts where shallow dip- and draw-wells are in common use, seem to be particularly subject to parasitic worms in the bowels.

Pure Water a Sanitary Necessity.—7th. Although it is not possible at present to assign to every impurity in water its exact share in the production of disease, or to prove the precise evil influence on the public health of water which is not extremely impure, it appears certain, says Dr. Parkes, that the health of a community always improves when an abundant and pure water-supply is given; and, apart from this actual evidence, we are entitled to conclude from other considerations, that abundant and good water is a primary sanitary necessity.

Rocks Yielding Pure Water.—As a general guide to the water impurities that may be expected in waters from the various geological formations enumerated, the following condensed summary of the best known facts, as given by Dr. Parkes, will prove useful. The granitic, metamorphic, trap-rock and clay-slate waters are generally very pure, often not containing more than from two to six grains per gallon of solid matter, which is chiefly made up of carbonate and chloride of sodium, with a little lime and magnesia. The organic matter is very small in amount usually, but shallow wells in disintegrated trap-rock may, of course, be fouled by surface washings or soakage. The water from millstone grit and hard oolite is also very pure, sometimes containing only four grains per gallon of mineral matters, which comprise the same saline materials as are found in granitic waters, with the addition of sulphates and a trace of iron.

Rocks Yielding Impure Water.—Soft sand-rock waters, on the contrary, are often impure, containing much sodium chloride or common salt, sodium carbonate, sodium sulphate, iron and a little lime and magnesia, amounting altogether to from thirty to eighty grains per gallon. The organic matter may also be abundant, that is, to the extent of from four to eight grains to the gallon, or even more. Occasionally, however, these waters are quite pure.

Sand and Gravel Waters.—The loose sand and gravel waters also vary much in their composition, and in tolerably pure gravels, not near towns, the water is often very free from contamination. In many sands, which are rich in salts, the water percolating through them is, of course, much affected, the dissolved solids amounting sometimes to seventy grains per gallon, and consisting of sodium chloride, sodium carbonate, sodium sulphate, with calcium and magnesium salts, and a good deal of organic matter. The water from the sandy plains of southern France is said to contain enough organic matter to produce ague in those who drink it.

Lias Waters.—Water from the lias clays varies greatly in composition, but is often impure, even 217 grains per gallon of mineral matters having been found in one instance.

Chalky Waters.—The typical "hard" water, from chalk formations, is very sparkling and clear, highly charged with carbonic acid, and contains from seven to twenty grains of calcium carbonate, a little magnesium carbonate and sodium chloride, with small and immaterial quantities of iron, silica, potassa, nitric, sulphuric and phosphoric acids in combination; organic matter is usually in small amount, and it is therefore a good, comparatively wholesome and pleasant water, which, though hard, softens greatly by boiling.

Limestone Waters.—The waters from limestone and magnesian limestone regions are also clear, sparkling liquids, of agreeable taste, but they differ from the chalk waters in that they contain usually more calcium sulphate, the sulphate of lime or gypsum, sometimes to the amount of twelve grains per gallon, and in dolomitic districts much magnesium sulphate and carbonate. They are not so wholesome as the chalk waters, are hard and soften less on boiling.

Selenite Waters.—Waters from selenite rocks are sometimes highly charged with sulphate of lime, even to the amount of twenty grains per gallon. They are unwholesome to many persons, producing dyspepsia and constipation, alternating with diarrhœa; are hard waters, which soften little on boiling, and are unsuited to either cooking or washing. Genuine clay waters are not common, for very few springs exist in the stiff clay.

Clay Waters.—The water of clayey districts is chiefly surface, and soon runs into converging streams. They often contain much suspended matter in the form of mud, but few dissolved constituents. Waters from the mixture of sand and clay brought down by the rivers, perhaps of former ages, and called Alluvium, are generally impure.

Alluvial Waters.—The alluvial waters contain calcium carbonate and sulphate, magnesium sulphate, sodium chloride and carbonate, iron, silica, and often much organic matter, the total amount of solids reaching 120 grains or more. Occasionally the organic matter oxidizes rapidly into nitrites, and, if the quantity of chloride of sodium is large, it might be incorrectly supposed, from analysis, that it was contaminated with sewage.

Surface Waters.—Surface and subsoil waters are often highly impure, and, although very variable in composition, are always to be regarded with suspicion until proved to be safe.

Heath Waters.—Heaths and moors, on primitive rocks or hard millstone grit, may supply a pure water, perhaps slightly colored, however, with vegetable matter. Cultivated lands, with richly manured soils, frequently give a dangerous water, containing both organic and saline matters in large quantity.

Soil Waters.—Some soils contain potassium, sodium and magnesium nitrates, and give up these salts in abundance to water which soaks through them. In towns, and among human habitations, the surface and shallow-well water is often very unsafe, as already explained. It may contain large quantities of calcium and sodium nitrates, nitrites, sulphates, phosphates and chlorides. Organic matter exists often in large amount and slowly oxidizes, forming nitric acid and ammonia.

Marsh Waters.—Marsh-water always contains a large quantity of vegetable organic matter, it being not unusual to find from twelve to forty grains per gallon, and sometimes even more. Suspended organic matter is also common, but the amount of saline impurity is very variable.

Poisoned Waters from Graveyards.—In water from graveyards, ammonium and calcium nitrites, and sometimes fatty acids, with much organic matter of animal origin, are met with. The water of a well at St. Didier, France, more than 300 feet from a cemetery, was found to be largely contaminated with ammoniacal salts and organic matter, which was left on evaporation. The water was clear at first, but had a vapid taste and speedily became putrid.

Artesian-Well Waters.—Artesian-well water varies greatly in composition, being so highly charged with saline matter sometimes that it is quite undrinkable. The artesian well at Grenelle, France, contains enough sodium and potassium carbonates to render it alkaline to the taste, although it is used for the water-supply of the town. In some cases artesian-well water contains an appreciable amount of iron; in other instances, when drawn from the lower part of the chalk formation, or the green sand below it, it is tolerably pure. The temperature of the water is usually high in proportion to the depth of the well. Thus, for example, a well at Louisville, Kentucky, bored to the depth of over 2000 feet, discharges an immense volume of water, the temperature of which is 75 degrees Fahrenheit. The amount of air in the water of deep artesian wells is often small, and this circumstance, with the frequently elevated temperature and high degree of saline impregnation, is apt to make such wells very unsatisfactory as sources of water-supply.

Seashore-Well Waters.—Lastly, water from wells near the seashore is apt to be brackish and objectionable on that account, even though it does not contain much organic matter. Dr. Parkes mentions one instance where a bored well, 150 feet deep, near the sea, yielded water impregnated with 500 grains of solids, including 380 grains of chlorides, per gallon.

THE DETECTION OF CONTAMINATED WATER.

Vigilance Over Drinking Water.—As a general rule, the examination of drinking water, in order to determine its purity, and consequent safety as a beverage, involves a chemical and microscopical analysis, which should always be made when circumstances permit. Moreover, it must not be forgotten that water which is usually pure and wholesome, may be at any time polluted by the fouling of its source during heavy rains, the occurrence of floods, the alteration in the customary course and flow of sewage, manufacturing refuse, and so forth, above or below ground. Constant vigilance over the condition of the water-supply is, therefore, exceedingly necessary to health; but as complete investigation requires the skill of a professed analytical chemist, those methods of examination need only be described in detail which are especially used as giving us warning of danger, with a few of the simpler tests.

Character of Water Tests.—For hygienic purposes, then, we examine water in order to discover whether it contains any suspended or dissolved ingredients which are likely to be hurtful. Some saline materials often found in water, as already mentioned, are not injurious when present in small quantities only, whilst others, consisting of or resulting from putrefying animal matter, are at once recognized as very dangerous to health. In any instance, reliance must not be placed upon the results of single tests, but all the circumstances of the case must be searched out and carefully considered.

Color Test of Water.—The examination of water by the ordinary senses, at least as regards its color, clearness and lustre, may be made by filling any tall glass vessel, preferably one having perpendicular sides, with the fluid, and standing it over a sheet of white paper, comparing it if necessary with a sample of pure filtered or distilled water, placed in a similar jar alongside. Perfectly pure water has a bluish tint, but most ordinary waters have a grayish, greenish, yellow or brown appearance. The best samples are tinged bluish or grayish.

Microscopic Objects Found in Drinking Water.

Green Waters.—Green waters generally owe their colors to vegetable matters, chiefly microscopic plants, and are usually harmless, although certain bluish-green plants of this kind give rise to the disagreeable smell popularly denominated the pig-pen odor, and probably render the fluid unwholesome as well as disgusting.

Yellow Waters.—Yellow or brown waters are the most to be feared, as their color is often due to animal organic matter, such as sewage. It is sometimes the case, however, that a yellow or brown tint is due to decomposed vegetable material, such as peat, or decayed wood, and the fluid is then merely unpleasant and not hurtful. Water is also occasionally colored in this way by some salt of iron, although in most instances the metal is precipitated as oxide of iron in the sediment.

Microscopic Tests.—The lustre or brilliancy of a water, which is recommended as a good test as to the amount of air which a specimen contains, can readily be judged by the eye; but the only satisfactory examination of the sediment must be made with the microscope, which ought to have a power of about two hundred and fifty diameters, although even an instrument of half that capacity will often reveal much of interest and importance in the deposit of a suspected drinking water.

Taste Not a Good Water Test.—The taste of a water is a very uncertain indication in regard to wholesomeness. Of course, any badly-tasting water ought at once to be rejected, but some very agreeable waters, as far as their tastes are concerned, have proved to be dangerously contaminated with sewage of the vilest character. And yet many people are to be found all over the country who think that if a water is bright and clear it must be good; nay, if it is the drinking fluid of their own wells which is called in question, they will often indignantly resent the faintest suggestion that it can possibly be in the least degree injurious to health. As remarked by Dr. Fox, however, such cases as that of the servant who, coming from an obscure village near the Dartmoor, in the southwest part of England, objected to the pure water of a distant town where she was in service, because it was devoid of both taste and smell, are becoming rare.

Where Taste Test Fails.—As regards dissolved mineral matters, taste is of little use, and differs much in different persons. On an average, common salt is not recognized until it reaches the quantity of seventy-five grains per gallon, whilst carbonate of lime is perceptible when dissolved in a water to the amount of ten grains per gallon; iron, however, can be recognized by its astringent flavor in very small quantities, occasionally as minute an impregnation as two-tenths of a grain per gallon may be thus detected. A permanently-hard water has sometimes a peculiarly insipid or slightly saline taste, if the total salts amount to thirty-five or forty grains per gallon and the sulphate of lime or gypsum to six or eight grains.

What Taste of Water is Due to.—The taste of good drinking water is due entirely to the gases dissolved; water nearly free from the hardness of carbonate of lime, held in solution by carbonic acid, such as distilled water, is not so pleasant as the brisk, highly-carbonated waters; it may be called flat, but it is difficult to define the kind of taste or the absence of it.

Smell as a Test of Water.—To observe the smell of a water, a portion of it should be poured into a wide-mouthed bottle or flask, so as to fill about one-third of its capacity, and then well shaken up. If the smell is unpleasant, the fluid may be at once pronounced unfit to drink. Should no smell be discovered, the flask should be gently heated by placing it in hot water of about the temperature of 110 degrees, and again shaken, and if there is still no odor evolved, a little caustic potash should be added to the warm water. Any unpleasant odor which may be given off after this further test indicates with tolerable certainty that the water contains organic impurities in considerable quantity. The occurrence of a milky precipitate of lime, on the addition of the caustic potash, will at the same time show that you are dealing with a hard water.

Form of Smell Test.—This test by the sense of smell is more delicate if employed in the following manner: Fill a pint bottle two-thirds full, cork it tightly and set it at a window where it will be exposed to the sunlight all day. The next morning, after slightly warming the bottle, uncork it and examine the odor, which, if at all putrid, indicates organic matter in dangerous amount.

Rules for Pure Water.—Although the general characters of a water, when examined as directed above, give only an imperfect idea of its value, they are yet important when no other investigation can be made. If the water be colorless, clear, free from suspended materials, of a good lustre, yet not too brilliant, devoid of smell and taste, except such as are recognized as characteristic of a safe and usable water, we shall in a majority of cases be justified in pronouncing it a wholesome drinking fluid; whilst, according to the degree in which it deviates from these characteristics, will we proportionately be sustained in regarding it with grave suspicion.

Chemical Tests the Best.—Visible suspended matter is probably often the most dangerous, although there is little doubt that the microscopic germs of various diseases may exist in small aggregations without being recognizable at all by the naked eye of even the most practised observer; and, of course, the metallic impurities, such as lead and copper, for detecting which rules have already been given, must often escape discovery by any examination which does not include the application of chemical tests.

Nessler Test of Water.—The one of these chemical reagents which it would be well to apply in every instance where it is possible to do so, is the "Nessler's test," an ounce of which may be procured from almost any good chemist for twenty or twenty-five cents. It constitutes a test for the products of decomposing animal matters, especially sewage materials, including human and animal excrement, and is therefore capable of giving timely warning against the most dangerous of the common pollutions of drinking waters.

The Ammonia Test.—In the whole round of chemical analysis there is no determination which surpasses that of ammonia from putrefying animal matter by this method in point of delicacy. It is questionable whether any other approaches it. The Nessler reagent is said to be capable of indicating one part of ammonia in twenty million parts of water, and even this assertion, surprising as it may seem, is given as an understatement of the delicacy of the test. Such being the characteristic of this way of calculating the ammonia, the great advantage of causing determinations of organic matter to depend on measurements of ammonia will be manifest to every one.

Form of the Nessler Test.—In order to make use of this reagent, fill an ordinary wine-glass or small goblet which will hold from two to four ounces, nearly full of the water it is wished to examine, and add three or four drops of the Nessler's solution. If a yellow or brown color, or a brownish precipitate, be produced, the water contains ammoniacal salts. As a rule, this should be regarded as a very suspicious circumstance, and should the coloration be well marked, it is almost sufficient of itself to condemn the water for drinking purposes. If a milky or curdy precipitate is also formed, it shows that the fluid is a hard water, and more or less unfit for washing. Should this whitish precipitate be excessive, it hides to a certain extent the yellowish color indicative of ammonia, so that it is necessary to take a fresh sample of the water, add to it a few drops of strong solution of caustic potash or soda, and after the precipitate of lime which is thus caused to fall has subsided, test for ammoniacal compounds with the Nessler's reagent.

The Soap-Test of Impure Water.—Clark's soap-test for determining the hardness of water is prepared by dissolving a small quantity of soap, say one ounce in half a pint of a mixture of equal parts of alcohol and water. It is used by dropping it into a measured quantity, such, for example, as an ounce of the water to be tested, until the fluid when shaken begins to form a beady lather—the relative number of drops required to produce this effect nearly indicating the comparative degrees of hardness of the waters undergoing examination.

Water Test Should Always be Made.—This soap-test may be used to decided advantage in all "hard-water" districts, and every one should test his water-supply at the earliest opportunity, with it, with the Nessler's reagent for organic ammonia indicating pollution by sewage, and with the sulphide of ammonium for contamination with lead. And the application of these two latter tests is important, even although the drinking water in question has been in use for a long time by various members of a family without apparent injury, for many instances are on record in medical books where chronic derangements of health have been due to impurity of the water taken into the stomach, and yet this source of injury has been entirely unsuspected until a chemical examination of the water-supply has revealed the insidious origin of the trouble.

Water Precautions for Travelers.—A wise precaution when traveling, especially in unhealthy districts or during an epidemic of any kind, is to drink none but boiled rain-water, which you can make sure has not been exposed to contamination by lead pipes, roofs or cisterns. To be effectual, the boiling ought to be continued briskly for half an hour or longer. Rain-water is preferable in limestone regions, because the hard water containing lime is partially or not at all improved in this respect by boiling, and gives rise to serious diarrhœa in many of those unaccustomed to its employment. Such hard water is also probably one great cause of the very painful calculous disorders.

HYGIENIC USE OF BATHS.

Temperature of Baths.—Coming now to the detailed consideration of water as applied to the human skin in the form of a bath, in order to accomplish the important hygienic purposes described, it is obvious, in the first place, that temperature has a powerful influence in this respect.

Cold Baths.—The range of the cold bath varies more than that of any other kind, extending, as it does, from 84 degrees Fahrenheit down to 33 degrees of the same scale. The lower temperatures included between these limits would, of course, test the endurance of even the strongest to encounter safely the severe shock which is generally produced by the sudden application, and still more the prolonged immersion of the body in a water so near its freezing-point; but from 84 degrees to 74 degrees the reaction required is so slight that few persons who are not actually invalids are too feeble to manifest it.

First Effect of the Cold Bath.—A shock is experienced throughout the whole nervous system, more or less severe, according to the lower or higher temperature of the fluid, and the contracting effect of the cold aids the spasmodic contraction occurring in the small blood-vessels to drive the blood to the inner portions of the body, and allow the surface to become quickly chilled.

Second Effect of the Cold Bath.—But if the cold is not too severe, or the individual is not exhausted by fatigue, or enfeebled by disease, a change in these conditions promptly manifests itself soon after leaving the bath, especially if the skin is rapidly dried by friction with some absorbent substance. The heart and pulse return to their normal rate of movement, the nervous system recovers from the shock which it has undergone, the blood flows back to the surface of the skin, and a glow of renewed warmth is felt throughout the entire body.

A Guide to Cold Bathing.—This agreeable change in the condition of the circulation and the sensations is called the *reaction*, and constitutes our very best guide to the employment of cool or cold bathing. If the water of a bath has been colder than is adapted to the strength of an individual's constitution, reaction comes on but slowly, and several hours may elapse before the natural balance of the circulation is fully restored. In such a case, the hands, feet and nose remain chilly, and also cold to the touch of another person. The fingers, lips and indeed the whole face, has a bluish tint, and a more or less shrunken appearance. The pulse continues weak and slow, and languor and feebleness characterize all the movements. Of course, the method of deriving the greatest amount of benefit from these indications is for each person to cautiously test the power of his system to establish reaction, commencing with a bath of 70 degrees or 65 degrees, and gradually descending the scale of the thermometer, as he finds he is able to fully react from the depression produced by venturing among its lower depths.

Time for Cold Bathing.—It is recommended by some authors to resort to cold bathing either about an hour before breakfast in the early morning, or else late in the evening just before retiring for the night. The early morning bath of this kind may do very well for some few people of unusually vigorous constitutions, but as a general rule the evening is a better time for such a test of strength; and for many persons the middle of the morning, that is to say, about three hours after breakfast, when the first meal of the day has been nearly all digested, and the system is fortified thereby to bear the shock and establish the necessary reaction after it, is decidedly preferable to any other period of the twenty-four hours.

When to Avoid Cold Baths.—Under no circumstances should a cold bath be indulged in either immediately before or immediately after a meal, on account of the tendency which its inevitable shock will have to produce more or less disturbance in the process of digestion by congesting the stomach and intestines. Nor are cold baths suitable for individuals in either extreme of life, because both in infancy and in old age the power of developing animal heat is least efficient in its operations, and the reaction is accomplished slowly or not at all.

No Cold Bath After Fatigue.—Protracted labor or exercise, whether mental or physical, if so long continued as to leave the body suffering from feelings of great weariness or exhaustion, absolutely forbid the use of the cold bath. It was under these circumstances that Alexander the Great, of Macedon, nearly perished, from plunging after a long and fatiguing march into the icy current of the river Cydnus; an imprudence which, it is said, did actually prove fatal to the German emperor, the aged Frederick Barbarossa, at the head of his crusading army, seventeen hundred years later. In adverting to this latter event an ancient author quaintly observes: "No wonder if the cold water quickly quenched those few sparks of heat left in him at seventy years of age."

Duration of the Cold Bath.—The duration of a cool or cold bath must vary very much with the temperature of the water. When very cold the period of immersion should not exceed one or two minutes, whilst with water between 60 and 70 degrees, the duration of the bath may extend to a quarter or even half an hour; in every instance, however, we must be guided by the completeness of the reaction on coming out of the water.

Friction After Cold Bath.—Energetic friction of the whole surface of the body after bathing is highly beneficial as tending to produce the necessary degree of reaction. Active physical exercise, as well as warm and stimulating drinks, likewise aid in accomplishing the same desirable result. Even when a person is accustomed to the daily use of the cold bath, any sudden reduction of strength, such as may result from intemperance in eating, an evening debauch, or excess of any kind, particularly of the sexual powers, or even over-exertion in walking or in field-sports, will forbid recourse to it the following morning.

River-Bathing.—Bathing in rivers is even more to be recommended than that in ordinary bath-rooms during the summer season, as the gentle exercise of walking to and from the river-side, and of swimming whilst immersed in the water, promote the reaction which is so conducive to health. Evil consequences are, however, apt to result from river-bathing, if the baths are too prolonged, if too violent exertion is indulged in, or if the rays of the sun overheat the head of the bather. Dr. Bell states that he has seen continued fever, of some days duration, and violent headache, with slight delirium, arise in boys who had thus imprudently exposed themselves.

VARIETIES OF COLD BATHS.

Cold Sponge-Bath.—There are various ways of employing water in cold bathing, according to the force of the current of fluid, the amount of surface to which it is applied, and so forth. Affusion and sponging are the mildest ways of using cold water as a bath, and there are few persons, not actually invalids, who cannot thus employ water, of moderately low temperature, with benefit. After the slight depression of the bodily warmth, produced by sponging with fluid of 60 or 65 degrees, of course but a mild reaction follows, but this is suitably proportioned to the feeble energies of debilitated persons. By a repetition of the process a greater endurance is developed, and colder water may ultimately be resorted to, with correspondingly increased advantage. The cool or cold sponge-bath is sometimes of great service in treating typhoid fever, and others of the eruptive diseases, as will be explained in the second part of this work.

The Shower-Bath.—In a shower-bath the water falls in divided streams, and thus, being generally distributed over the whole body, gives a severe shock to the system; such a one, should the fluid be of a low temperature, as only the most vigorous persons can endure.

The Cold Douche.—The cold douche differs from the shower-bath in that the water of a douche is poured upon the surface of the body in a solid column, instead of a number of small streams. It is sometimes highly efficacious in reducing the violent excitement of delirious or insane patients, but, being a very powerful agent, should be used only with caution and close watching, never in the indiscriminate way customary in some so-called hydropathic establishments, from which it is said that more than one sudden death has been the lamentable result.

The Bath for Old Age.—The advance into old age of those who, in the vigor of youth and maturity, have accustomed themselves to the regular use of the cold bath, does not necessarily interpose an obstacle to the continuance of the practice of bathing, provided the general health remains good. But if there be evidence of feebleness of the functions, or disorder in any one of the great systems of the body, such as the digestive apparatus, or the muscular system, so as to prevent the customary allowance of nutritious food, or of exercise being taken, the cold plunge or shower-bath should be given up, and simple washing with cold water, followed by active friction, substituted in its place. Should even this prove rather too great a shock for the enfeebled powers of life, as may be evinced by want of prompt reaction subsequently, recourse to anything but the tepid or warm bath must be strictly prohibited.

The Water-Cure.—The evidence in favor of great benefit being derived in suitable cases from the so-called water-cure, in the numerous hydropathic establishments of Europe and this country, is very convincing; and, in fact, it is probable that persons generally of great mobility of temperament, who are readily excited and readily depressed, and whose nervous system is soon exhausted by either bodily or mental efforts, will often find relief in the systematic use of a moderately cool or cold bath.

Objection to Hydropathy.—The difficulty is with establishments of this kind that, being carried on as business enterprises, their proprietors are not withheld, by any philanthropic considerations, from looking at every case which applies to them with an eye to business, and recommending their particular cure to all possible patients, except where they are very sure that positive injury will result from the treatment. It is therefore advisable, in every instance, to consult some reputable physician, who is not devoted to any exclusive system or dogma of medical practice, before submitting oneself to the powerful agencies of water as applied by hydropathic practitioners.

Cold Bathing Removes Heat.—Dr. Bell judiciously remarks that there is a class of people, who suffer from a sedentary life, devotion to the desk in business, or to study, and complain of a troublesome heat and dryness of the hands, and sometimes of the feet, with accelerated pulse and thirst; their appetite is not good, nor their sleep sound or refreshing. Though their systems be actually weaker than usual, yet is there morbid activity of the skin, owing, in part, to the vessels of the integument not relieving themselves by free and regular perspiration. Cold bathing, by moderating cutaneous excitement, and relieving the perspiratory organs, removes the unpleasant feeling of heat and dryness; and, by sympathy, produces nearly correspondent effects on the stomach.

The Flesh-Brush and Exercise.—The use of the flesh-brush and exercise in the open air are, it may be supposed, powerful auxiliaries to the measures just recommended.

Cold Bathing for Rheumatism.—There are many persons who, though enjoying what is often called full health, are liable to colds, rheumatic pains and stitches from any slight exposure to cold or moist air. Their vascular and nervous systems are both tolerably excitable, and they are readily thrown into perspiration from even moderate exercise or warm apartments. In them it is desirable so far to regulate the functions of the skin, as to moderate its stimulation, and prevent the consequent debility which follows this state. Cold bathing accomplishes this purpose, and keeps the skin in a less constant condition of excitement, renders it less liable to sweat so freely from exposure to external warmth or by active exercise, and, of course, prevents the subsequent languor and susceptibility to morbid and enfeebling agencies. It would be a great mistake, in such a case, to talk of the tonic action of cold bathing. Its beneficial operation is evinced here at a time when no stimulus or tonic is admissible, and in habits sanguine and plethoric, on which nearly similar effects with those from cold bathing would be produced by a moderate bleeding, reduction of the usual quantity of food and diluent drinks.

HYGIENIC APPLICATION OF WARM BATHS.

Temperature of Warm Bath.—When the water used for bathing has a temperature of from 92 degrees to 98 degrees Fahrenheit, it produces upon the skins of most people the sensation of warmth, and although water of this degree of heat is usually employed chiefly for cleansing purposes, yet it has hygienic properties of a sufficiently marked character to render it worthy of especial notice. Since water is a much better conductor of heat than air, and especially than confined air, as much caloric is extracted from the human body when immersed in water which is only a few degrees lower than the average human temperature, as by air of much greater relative coldness.

Effect of Warm Bath.—The warm bath diminishes the frequency of the pulse, especially when it has been greater than natural, and this effect is almost exactly in proportion to the duration of immersion. It also renders the respiration slower, and diminishes the temperature of the body, relaxes the muscular fibre, increases the bulk of the fluids by absorption, or perhaps only by restricting evaporation from the skin, removes impurities from the surface, promotes desquamation and renewal of the cuticle, lessening the hardness of the nails and indurations of the epidermis.

Separation of Outer Skin.—The separation of the outer layers of the scarf-skin or epidermis, which may often be seen floating in small whitish fragments upon the bath water, is due to two causes. In the first place, it is softened by the water, and so rendered more easily removable by slight friction; and secondly, it is in part pushed off by the increased fullness of the blood-vessels underneath. A humorous writer has compared the epidermis which covers the whole surface of the body to a tight shirt, and a dirty cuticle, therefore, to a dirty shirt which is gotten rid of by the aid of a bath.

Take Short Warm Baths.—A prolonged daily use of the warm bath is apt to cause eruptions on the skin similar to those which managers of water-cure establishments pronounce critical, and of the greatest advantage in certain diseases of the nervous system.

Warm Baths Soothe the Nerves.—An immediate and very agreeable effect of the warm bath is to soothe a nervously excited condition and promote sleep, which to many people is peculiarly refreshing when procured by this means.

Time to Take Warm Baths.—The best period for taking a warm bath is about an hour previous to the mid-day meal, because then the disturbance of the circulation will have time to pass off before food is introduced into the stomach, and the secretion of the gastric juice and other fluids necessary for digestion will not be thereby interfered with.

Duration of Warm Baths.—The duration of a warm bath ought not to exceed in ordinary cases half an hour, although in the warm water-cure of Leuk, in Switzerland, patients sometimes remain in the tepid fluid five hours in the morning and three hours in the afternoon, with alleged benefit. In the Leuk baths, persons breakfast from little floating tables, which afterwards serve to support books and newspapers for their amusement, and it is said that the Emperor Charlemagne used to hold prolonged levees whilst immersed in his warm bath at Aix-la-Chapelle, which was supplied by one of the numerous thermal springs of that famous city.

Warm Baths in Acute Diseases.—The relaxing and soothing influence of the warm bath is an invaluable aid to the treatment of many acute diseases, and being, as a general rule, devoid of danger in its application, is a remedy peculiarly adapted to domestic practice, particularly among children, before the skilled physician, who should always be sent for immediately when a person is attacked with any acute disease, has time to arrive. Its prompt remedial effects may often be observed in bilious colic, in painters' colic induced by the poisonous influence of lead, in spasmodic croup, in infantile convulsions, in mental excitement bordering on delirium or even violent maniacal frenzy, and in many other diseases, as will be more fully explained in the second part of this book.

HOT BATHS.

Temperature of the Hot Bath.—The hot bath is so designated if the water employed is above the natural blood-heat of about 98 degrees Fahrenheit, and may range as high as 110 degrees, above which it is seldom safe to use water over the whole surface of the body. Of course, habit will often enable a person to endure the local application of water having a much higher temperature than this without injury.

Effect of Hot Baths.—Hot baths are decidedly stimulating, and rapidly produce redness of the skin with quickening of the pulse and respiration. Perspiration is poured out upon the face in great abundance, the mind becomes dull and inattentive, and, if the immersion is unduly prolonged, vertigo and apoplexy may supervene. One experimenter lost, during the short space of eight minutes, in a bath of the temperature of 113 degrees, about a pound and a half of his weight. Even a hot foot-bath of 110 degrees is stated in one case to have quickened the pulse from seventy-seven to ninety-two, and to have caused some headache in about half an hour. In another instance a foot-bath of 113 degrees raised the pulse from sixty to one hundred and five beats per minute in five minutes, and flushed the face, but without bringing on headache.

Where Danger Lies.—The hot bath ought therefore to be employed cautiously or not at all by persons of sanguine temperament, and those of robust or plethoric habit of body, especially if there is any hereditary tendency to apoplexy in their families.

Where Good is Derived.—This powerful remedy is, however, capable of doing good service in conditions of torpid, sluggish circulation, dry and cold skin, feebleness of muscular movement, and a low grade of sensibility; but great care must be used not to mistake this state of the system in an individual naturally weak and phlegmatic, or enfeebled by old age or chronic disease, for the languor of the vital processes which is produced by acute inflammation, or pressure of the blood upon the brain or upon the lungs.

When to Avoid Hot Baths.—In suspended animation from sunstroke, apoplexy, insensibility from inhaling noxious gases, or from swallowing narcotic poisons, disastrous results might be, and probably would be, produced by the application of a hot bath.

When to Use Hot Baths.—In exhaustion and torpor from exposure to intense cold, the hot bath, contrary to popular opinion on the subject, is a most valuable remedy. Some recent experiments performed in Russia, in order to determine what is the best way to resuscitate animals which have been subjected to such severe cold as to be almost fatal in its effects, gave the following results: Of twenty dogs treated by the customary gradual method of bringing them into a cold room which was slowly warmed, fourteen died; of twenty similar animals introduced at once into a warm room, only eight died; whilst of twenty in an analogous condition, which were placed at once in a hot bath, *all recovered.*

Local Hot Baths.—Hot baths applied locally to small portions of the body only have often proved beneficial in gout and in acute as well as chronic rheumatism, and are highly recommended by some authorities for the relief of piles, in certain affections of the kidneys, and in some female disorders. Sundry modifications of the hot bath, such as the Turkish bath, the vapor bath, and so forth, have, under certain circumstances, considerable value.

THE HYGIENE OF SEA-BATHING.

When to Refrain from Sea-Bathing.—The long line of seacoast belonging to the United States, and the large proportion of our population which resides within a day's journey of the ocean, by placing a salt bath within the reach of many readers, render the subject of sufficient importance to be separately discussed. On paying a visit to the seaside, it is well to refrain from bathing, and indeed from exposure to the rays of the sun on dry land also, for a day or two if possible after arrival, or until the system becomes a little accustomed to the effect of the salt air and the surroundings. The rules already given in regard to the time of bathing, and especially as to not entering the water for an hour or so before or after a meal, ought to be strictly adhered to.

Duration of Sea-Baths.—The time spent in the water cannot be prescribed with the same exactitude, since the proper length of a dip in the ocean varies very greatly with the temperature of the water and air, the vigor of the individual's constitution, his temporary condition of health, and so forth. But in the state of the circulation we fortunately have a general guide, which every one can readily consult for himself, and quickly determine when nature decides that the bath should promptly terminate. After the first shuddering inspiration, which is generally produced by the application of cold water to the bare surface of the body, with the quickened pulse and breathing which for a few moments accompany it, the pulse, the action of the heart, and the respiration all become slower for a short time, and then are again accelerated.

Signs to Stop a Sea-Bath.—But if immersion in the cold sea-water is is too long continued, the pulse and the breathing are again reduced in frequency, a sense of chilliness comes on, and with this a slight blueness of the lips, and of the fingers underneath the nails, makes its appearance. The moment this is perceived it should be accepted as an imperative order to quit the water at once and restore the lost activity of the circulation, which it indicates, by energetic friction of the surface with warm, dry towels as speedily as possible. As a general rule, from five to fifteen minutes is amply sufficient time to spend in the surf, and it is far better to err on the prudent side by coming out needlessly soon, than to prolong the bath until the teeth begin to chatter and the fingers have the shrivelled, bluish-white appearance of a washerwoman's hand, thereby risking some serious internal congestion afterwards. When the water is unusually cold, and especially when the air is also chilly, a bath in the ocean, if taken at all, should be correspondingly brief.

What Sea-Bathers Should Do.—In order to obtain the best results, a bather should enter the water whilst he is comfortably warm, and yet not in a free state of perspiration. It is a good plan to wet the head and breast first, or after wading only a short distance from the edge, for the purpose of avoiding the temporary fullness of the brain, which leaves some persons with a dull headache for several hours; also, if the sun is shining brightly, a bathing hat, or other protection for the head and nape of the neck, ought always to be worn.

Adjuncts of Sea-Bathing.—Floating, diving and swimming are excellent ways of adding to the pleasure of the sea-bath, but the latter should not be indulged in when the surf is very heavy, when the tide is running out, or when there is a strong current nearly in a line with the margin of the beach, as the latter may diverge a little from the coast, and carry the bather too far out to sea before he is aware of his danger.

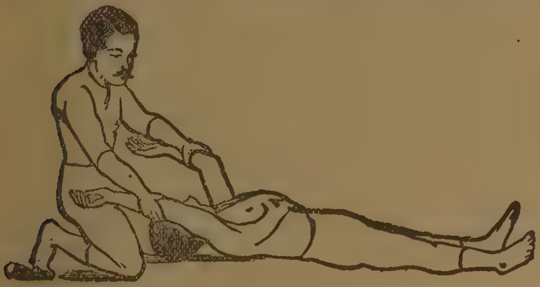
BATHING ACCIDENTS.

Rescuing the Drowning.—A summer so seldom passes at the great seaside resorts without the sacrifice of one or more lives to the want of knowledge respecting the treatment of half-drowned persons, and its timely application, that a few suggestions seem to be called for here, in connection with remarks upon salt-water baths. When a person is seen struggling beyond his depth, the best plan is for a party of rescuers to form a line, holding each others' hands, so that the individual constituting the outer link may be drawn in by the others if grappled and endangered by the drowning man. In endeavoring singly to save an exhausted swimmer, beware of his death-grip, which is often fatal, and try to seize him from behind, by the hair or collar, and tow him to land.

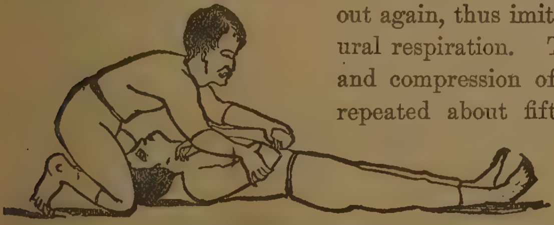
Restoring the Drowned.—On arriving at the shore, if the person, when drawn out on the sand, makes no effort to breathe, lose no time in trying to secure shelter, warmth, stimulants, or even dry ground, but proceed at once, without a moment's delay, to practice artificial respiration, which should be continued faithfully for at least two hours, as even after that length of time without a sign of life, recovery has taken place.

A Good First Rule.—A good first rule is to instantly remove all obstructions to breathing, by loosening or cutting apart all neck or waistbands; then turn the patient on his face with the head down hill, stand astride of his hips with your face towards his head, and locking your fingers together under his belly, raise the body as high as you can without lifting the forehead off the ground, and while thus held give the body a smart jerk to expel, if possible, mucus from the throat and water from the windpipe. To facilitate this important preliminary, let an assistant at this moment pry open the mouth and pull out the tongue, seizing it by the aid of a dry handkerchief.

A Good Second Step.—The next step is immediately to turn the body over on its back, slip a rolled-up blanket, shawl or coat under the shoulders, and proceed at once to imitate natural breathing. To do this let the operator grasp the arms of the patient just above the elbows, and draw them upward until they nearly meet over the head. (See first cut.) After pulling them upward forcibly hold them in this position whilst you count slowly, one, two, and then bring them down to the sides again, and press, by means of the elbows, upon the lower part of the chest (see second cut), and the upper part of the belly immediately below the breast-bone, whilst you again count one, two. The former of these movements expands the chest and draws some air into the patient's lungs. The latter motion, which is like shutting together the handles of a pair of bellows, compresses the chest and drives some of this air which has been sucked in out again, thus imitating the process of natural respiration. This alternate expansion and compression of the chest ought to be repeated about fifteen times per minute, and kept up for two or three hours. It is probably more successful in resuscitating those who are apparently drowned than at first sight appears; because some of the people brought to shore under such circumstances as have been described, are dead from heart-disease or apoplexy, and are therefore hopeless subjects for treatment by artificial respiration.



Resuscitation of the Drowning.



Resuscitation of the Drowning.

PREVENTIVE MEDICINE.

PART II.

PURE AIR AS A CONDITION OF HEALTH.

THE VITAL NECESSITY OF AIR.

Value of Pure Air.—There are some things in nature of which we take but little cognizance, probably from the fact of their apparent simplicity. Pure air, pure water, pure food are essential and fundamental to good health and health to happiness, so we see that our very lives depend upon the exercise of principles which we neglect to study and understand, possibly on account of other and manifold duties. But nature's laws are invariable, and the time comes when dire results follow a disregard of first principles. Any one will admit that pure, unadulterated food is necessary to health. Food is converted into blood, which having circulated through the body is unfit for further use until purified.

Air a Blood Purifier.—It is through the medium of the air, with its life-giving oxygen, that the blood is purified. It therefore follows, logically, that air and pure air is necessary to health and, other things being equal, the health will be imperfect in proportion to the impurity of the air we breathe. It should be our aim to learn much of so important a condition of health in order that we might, so far as is possible, avoid disease.

Necessity of Pure Air.—Not only is pure air of value to preserve a state of health, it is an absolute necessity. It is true that some persons with strong wills and capacious lungs can perform the feat of holding the breath, but if they endeavor to prolong the experiment from a minute and a half to two minutes the need of breathing becomes so intense that control over the muscles of the chest is lost and a deep inspiration must be drawn in spite of resolutions to the contrary. If the access of fresh air to the lungs is absolutely prevented by external force death speedily takes place, the fatal result occurring in from five to fifteen minutes. This latter condition is present in hanging and drowning and in some forms of croup in children. Four minutes is the limit of time a person can be deprived of oxygen and live.

Fatal Results from Impure Air.—No better illustration of the fatal effects of impure air upon the human system can be brought forward than the lamentable history of the Black Hole of Calcutta, a prison in India, the horrors of which have rendered it memorable even in that land of ferocious cruelty. According to the account of a survivor, 146 persons were shut up on a sultry night in June in a prison eighteen feet square, furnished with only two small windows, both strongly barred with iron. The thirst and oppression of breathing felt by the unhappy prisoners soon became intense, and the scanty supply of water brought in compliance with their entreaties only made the confusion more terrible, and caused several to be trampled to death. This scene of misery proved entertaining to the brutal guards outside, who supplied them with water that they might have the satisfaction of seeing them fight for it, as they phrased it, and held up lights to the bars in order that they might lose no part of the inhuman diversion.

Frantic Pleas for Air.—Before eleven o'clock most of the gentlemen, who formed about one-third of the whole, were dead, and "air! air!" became the general cry. Renewed insults were devised for the purpose of provoking the guards to shoot them, and every man had eager hopes of meeting the first bullet. About two o'clock in the morning the survivors crowded so much to the windows that many of them died standing, unable to fall on account of the throng. About six in the morning an order came for their release; but at that time, out of the 146 who went into the dungeon ten hours before, only 23 remained alive, and all these miserable survivors were in a highly feverish condition, several dying from putrid or typhus fever soon afterward.

We Breathe Out Poison.—Such, then, are the frightful consequences of overcrowding together a large number of human beings, and thus depriving them of fresh air in such a way that they are exposed to the poisons of their own contamination, comprising carbonic acid and the secretions from the lungs and skin. Wholesale poisonings by very impure air of this kind are fortunately seldom met with, but the gradual injury to health and destruction of life-force, produced by breathing an atmosphere slightly contaminated with noxious ingredients, are exceedingly common, and probably give rise to or aggravate a large part of the diseases to which our flesh is heir.

QUALITIES OF PURE AIR.

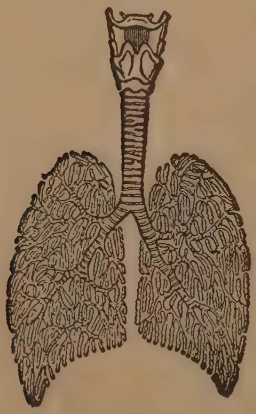
Composition.—In speaking of pure air we refer to a standard condition of air. The air is a mechanical mixture of elements. As ordinarily met with at the surface of our earth, pure air, when analyzed, is found to be composed of seventy-nine parts of nitrogen and twenty-one parts of oxygen to every one hundred parts of air. It contains also a considerable quantity of watery vapor, a trace of ammonia, and from three to six parts in ten thousand of that deleterious gas carbonic acid. Oxygen is the active element. If a candle be held in oxygen it would burn more brightly than in ordinary air, and so our own lives, if lived in an atmosphere of oxygen, would be more quickly spent. Our tissues would be quickly used up. Nitrogen, which forms so large a proportion, acts simply as a diluent; of itself it cannot support life, and a lighted candle held in nitrogen gas is quickly extinguished. Carbonic acid gas, or, as it is called, carbon dioxide, is normal to the extent of .04 per cent., and though it is useless to animals, it is quite as necessary to plant life as is oxygen to us.

Localities of Pure Air.—As air is rendered impure by respiration, the purest air is found in those localities farthest removed from human habitation, *i. e.*, on the mountain tops and upon the ocean. When there is a tendency to disease or during recovery from a disease residence in the mountains or at the seashore is of distinct benefit.

In order to understand how it is that the breathing in and out of the air of a room in time vitiates it, it will be necessary to explain some points of the anatomy and physiology of the respiratory tract—and the act of respiration.

RESPIRATORY TRACT.

Anatomy.—The respiratory tract is made up of the lungs and the air passages leading to them. The air passages comprise the larynx or voice box, the trachea or windpipe and the bronchial tubes—two in number—which are branches of the trachea.



The Lungs.

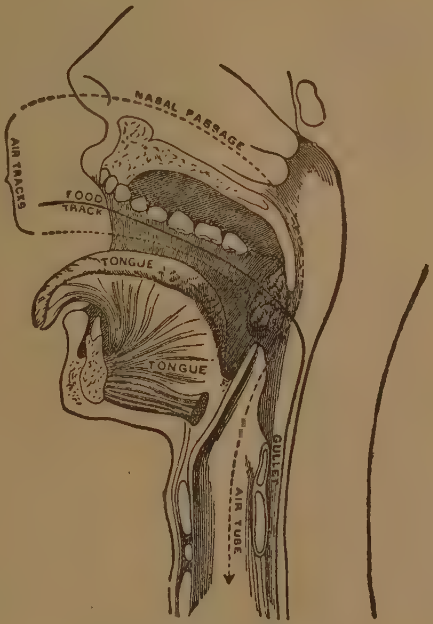
The Larynx.—The larynx is situated at the upper part of the trachea and presents in front the prominence known as Adam's Apple.

The Trachea.—The trachea or windpipe is four and a half inches long, and extends from the larynx to about the middle of the breast-bone or sterum, where it divides into the two bronchial tubes.

The Lungs.—The lungs, two in number, are situated in the cavity of the thorax or chest, one on either side of the heart. The lungs are made up of lobes, and the lobes are made up of still smaller divisions called lobules or little lobes. These latter are quite small, one one-hundred and twentieth of an inch in diameter, and they represent the ultimate divisions of the bronchial tubes, which have ramified and subdivided like the branches of a tree. Surrounding each lung and lining the cavity of the chest is the pleura, an inflammation of which constitutes the disease known as pleurisy.

Physiology.—The larynx, trachea and bronchial tubes admit the air to the lungs. The larynx, in addition to this function, is the organ of voice, being supplied with the vocal cords. Voice is produced by the outgoing air setting these cords into vibration. The air cells, of which the lungs are composed, are the meeting places of the air and the blood for the purpose of the exchange of oxygen and carbonic acid.

Heart Functions. — The heart, which is a thick, strong muscular bag, pumps the blood through the lungs as it goes round and round through the circulation, at the rate of about sixteen hundred pints of the vital fluid every hour. These sixteen hundred pints of blood, by being spread out in the fine network of delicate tubes in the walls of the air-cells, get rid of nearly sixty pints of carbonic acid, and absorb rather more than sixty pints of oxygen in that length of time. Upon this gaining of fresh oxygen and getting rid of stale carbonic acid unceasingly, our very lives depend, for, as demonstrated in hanging and drowning, if this interchange of the gases in the blood is interrupted for even the space of a few minutes death is the effect.



The Air Passages of the Lungs.

Unceasing Heart Pumping.—Whilst life continues, night and day, our hearts must go on pumping dark, purple, venous blood into the lungs, to be there purified and changed into red arterial blood by losing its carbonic acid and gaining fresh oxygen, which is carried to every part of our bodies, as has been just explained, conveying everywhere its own new and vigorous life. Night and day, too, quite as unceasingly, must the lungs do

HUMAN INTERNAL ORGANS.

THE LUNGS.

Upper Left-Hand Plate.—This handsome plate shows, at the top, the windpipe (trachea), entering the lungs. It divides into two branches, one for each lung, and each branch subdivides, so as to carry air to every part of the lung.

Lobes.—The plate shows the two great parts of the lungs, right and left lobes. These are filled with the air cells. Notice in the lobes the immense number of veins which form the circulatory system of the lungs.

Heart.—The heart is seen in its true position, to the right of the centre.

Pulmonary Vein.—To the left of the centre is seen the great pulmonary vein, carrying the lung-blood to the left auricle of the heart.

Pleura.—The pleura membrane is seen surrounding the entire lungs and walling them in.

THE LIVER.

Upper Right-Hand Plate.—The liver is the largest gland in the body. Situate on the right side, and partly covers the stomach.

Lobes.—The plate shows its two lobes on upper surface and five on under surface.

Vessels.—The entire circulatory system is shown—portal vein, hepatic artery, hepatic duct, lymphatic and smaller veins. To the left, in pear-shape, is the gall bladder.

THE HEART.

Lower Left-Hand Plate.—The plate shows the cone-shaped heart, situate in the chest, between the lungs, its apex toward the left. Though supplying blood to the whole body, it yet has its own circulation, as seen by its veins.

Cavities.—It has four cavities, an auricle and ventricle on each side. The right auricle receives the veinous blood and pumps it into the right ventricle. The right ventricle throws its blood into the left auricle. The left ventricle pumps it into the aorta and thence through the body. The upper section of the plate shows the aorta and the great pulmonary vein.

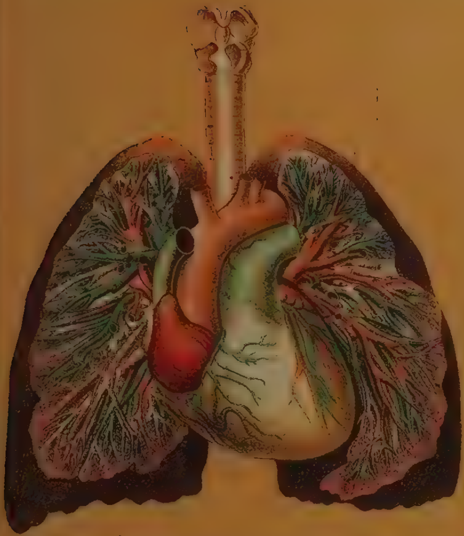
THE STOMACH.

Lower Right-Hand Plate.—The plate shows the stomach when one is in a reclining position.

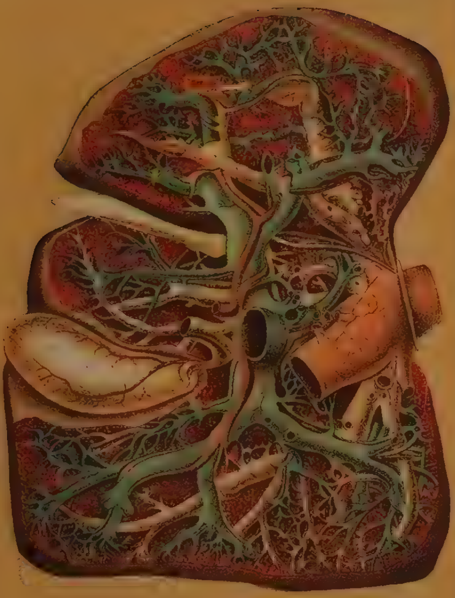
Veins.—The numerous veins show how well it is nourished.

Liver.—To the left is the liver. Above it is the opening through which food passes from the gullet (esophagus). At the opposite end is the pyloric gate, through which the partly digested food passes into the duodenum (twelve-inch bowel).

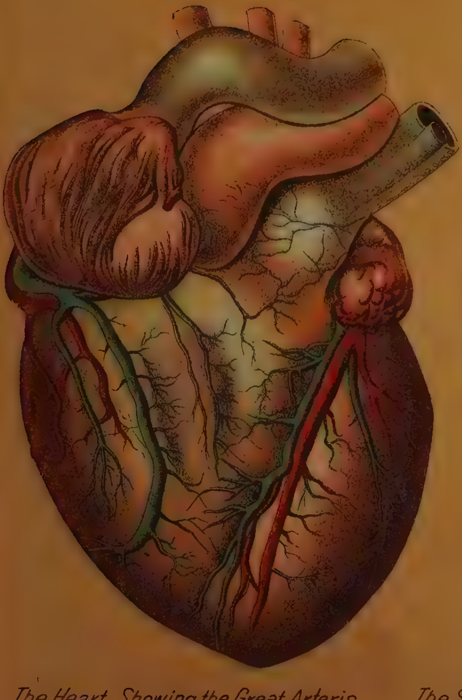
Muscles.—Around the stomach, in brown and white, are seen the powerful abdominal muscles. The white represents streaks of fatty matter. The stomach is usually about twelve inches long and four inches in diameter.



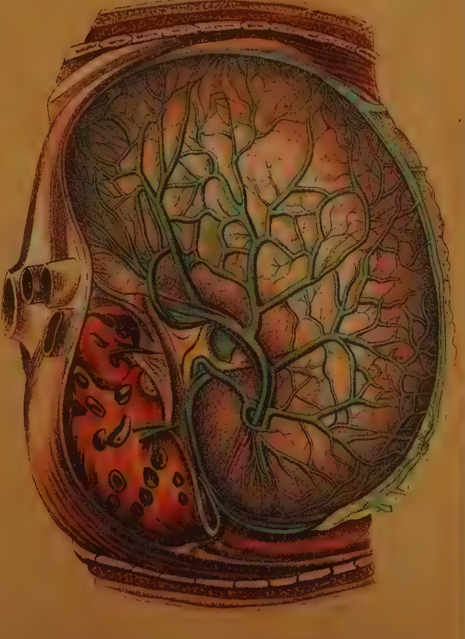
Lungs & Heart in Position



Section of Liver



The Heart Showing the Great Arteris.



The Stomach – Front view Figure in Reclining Position.

Human Internal organs

their part, by pumping in fresh air to furnish this requisite supply of revivifying oxygen; and, what is almost equally important, they must pump out the air which has been partly deprived of its oxygen, and has received in its place the worn-out and now deleterious substances got rid of by venous blood. This constitutes the pulmonary circulation in distinction to the circulation of the blood through various parts of the body for purposes of its nutrition which constitutes the systemic circulation.

Respiration.—The lungs, which contain the air, are not active in the act of respiration. The chest cavity enlarges by the contraction of the diaphragm and the elevation of the ribs and sternum, so that the chest is enlarged in its vertical, its transverse and its antero-posterior dimensions. With this enlargement the pressure from without is greater than the pressure from within, and the air rushes in, thereby distending the air vesicles. In expiration the chest-cavity diminishes in the diameters in which it has been increased, and, as a result, the air in the lungs is subjected to pressure, and consequently rushes out. The air that passes in and out with each respiration is called tidal air, and is equal to twenty cubic inches of air. But, after an ordinary inhalation, it is possible, by the exercise of a little effort, to breathe in still more air, to the extent of one hundred cubic inches. This is called the complemental air. After an ordinary expiration it is still possible to breathe out air to the extent of one hundred cubic inches. This is called the supplemental or reserve air.

Residual Air.—After all efforts to expell air from the lungs there still remains about one hundred cubic inches, called the residual air, from the fact that it resides in the lungs. But we must not get the idea that this residual air is unchanged, for it is ever being purified.

Frequency of Breathing.—The respirations vary from fourteen to eighteen per minute. They are greater during infancy and childhood. It is then during respiration that the fresh air, laden with oxygen, is carried to the blood to give to the blood its oxygen and to receive in its place carbonic acid. But the air does not meet the blood directly. On the outer side of the air cells we have the air, while distributed on its inner side we have the small blood-vessels or capillaries which have carried the blood to the lungs. So that separating the air from the blood we have, first, the walls of the air cells, and second, the walls of the capillaries. But these two are so thin and delicate that the exchange can readily take place through them.

Outline of the Chest Cavity.

IMPURE AIR.

The Impurities of the Air.—The light of modern research has enabled us to know much of atmospheric conditions conducive to disease and health, the latter particularly engaging our attention at this time. The impurities of the air are, first, suspended substances and, second, gaseous substances. The suspended substances are particles of almost every known substance, the most important being sand, dust, soot, pollen, micro-organisms of all kinds, particles of food and clothing. The gaseous impurities are carbonic acid, whenever it exceeds .05 per cent.; carbon monoxide; sulphur dioxide; sulphuric, hydrochloric and nitric acids; hydrogen, sulphide, ammonia and its compounds, and organic vapors from decomposing animal and vegetable matters.

Action of Impurities of the Air.—The solid impurities act by clogging up the air vesicles, thereby interfering with their function. They may of themselves be causes of disease, as in the case of micro-organisms. The gaseous impurities act, first, by virtue of their own toxic or poisonous properties and, second, by the fact that they take the place of the necessary element, oxygen. Carbonic acid is normal to the extent of .04 per cent. As before mentioned, air that we inhale contains twenty-one parts of oxygen and seventy-nine parts of nitrogen to every one hundred parts of air. On the other hand, expired air contains sixteen parts of oxygen, five parts of carbonic acid and seventy-nine parts of nitrogen. If, now, we should be placed in a room where the air is unchanged the air inhaled contains a greater percentage than .04 per cent., and is consequently impure.

Carbonic Acid.—Carbonic acid is the most common impurity of air, and, with its associated organic matters from human or animal breathing, pollutes the atmosphere of closed or badly-ventilated apartments in the manner already described. Acute poisoning from contaminated air, such as took place in the Black Hole of Calcutta, is very uncommon, because people who are long shut up in over-crowded rooms always feel such an overpowering need of fresh air that they can be prevented only by main force from hurrying away from the danger to which they are exposed. Nature warns them so emphatically and imperatively to seek a purer atmosphere that they become ready to sacrifice everything to obey her commands.

Symptoms of Air Poisoning.—The early symptoms of oppression from breathing impure air are too well known to require any lengthened description, although the direct connection of many uncomfortable sensations experienced in crowded rooms, with the aerial contamination, is not so generally understood and appreciated. Among the primary indications of physical injury to the blood from inhaling vitiated or "second-hand" air, are a disposition to draw long, full breaths, as a result of the stifled or almost suffocated feeling which early makes itself apparent. This is accompanied, or soon followed, by flushing of the face, throbbing of the temples, headache and sickness at the stomach, which may even proceed so far as faintness or an actual fainting-fit, as we often see in delicate ladies accidentally wedged in crowded lecture-rooms, concert-halls or theatres.

Chronic Effects of Air Poisoning.—The chronic effects of long-continued breathing an air which is but moderately polluted are seen in a general deterioration of the strength, appetite and digestion, a pallid dyspeptic appearance, from want of renewal of the blood.

Bacteria in the Air.—Bacteriology has explained the cause of many diseases. The air is everywhere laden with them. They enter our bodies through the respiratory and digestive tracts. If our vitality or resistance is sufficient to withstand their invasion we remain in a state of health; but, when the vitality is lowered for any reason, the bacteria invade the system and disease results. The bacteria present in the atmosphere are not, as a rule, actively disease producing. Those that do produce disease are found particularly where the discharges of diseased animals have been allowed to collect and dry. These excretions become pulverized and are subsequently carried about in the air we breathe. The dried expectoration of cases of tuberculosis, of influenza, and occasionally of pneumonia, produce these diseases in this manner. The boards of health in various parts of the country are fast coming to the conclusion that expectoration upon the sidewalks, in the street cars, in public halls, and so forth, is a menace to the public well-being. In hospitals patients suffering with tuberculous disease are obliged to expectorate in special cups or pasteboard boxes, which are kept covered and subsequently destroyed. Similar measures might be adopted in private practice.

EVIL EFFECTS OF EXPOSURE TO DRAUGHTS.

Cold Air.—Cold air, and especially cold, moist air, is so often a factor in the production of disease that the consideration of this constantly impending danger to health and its hygienic treatment by the means of suitable clothing is very important.

Clothing.—Contrary to the popular notion, clothing gives no heat in itself, but only saves the heat of our bodies from escaping into the surrounding air, and it does this just in proportion as it is a bad conductor of heat. The rate at which our raiment carries off the bodily heat varies from that of a thin linen coat, for example, which conveys it away rapidly, to that of a thick fur cloak, through which the loss of heat into the surrounding air is very gradual. Upon this difference in conducting power for heat the relative value of different articles of dress depends.

Why Clothing Comforts.—Much of the comfort that clothes afford is due to the fact that they give what is called an "artificial surface" to our bodies, on which the cold air can act without our feeling it so much. It is the absence of this artificial surface on the bare hands and face which makes the fingers, forehead and ears ache so with the cold, sometimes in wintry weather, and the reason that people's toes, after a while, often ache in the same way, is that the foot-coverings frequently become chilled through, so that they no longer do their duty as protectors against loss of heat.

Hardening Process.—The process of "hardening oneself" consists in rendering the skin so used to changes from a warm to a cold air, that its blood-vessels and nerves are comparatively little affected by the contracting influence of the cold. "Making oneself tender," on the contrary, is establishing the habit of staying in warm air, and venturing out only when well wrapped up, to such an extent that any accidental exposure to even moderately cold blasts has a powerful, or even dangerous, effect. Hardening the skin against the weather is just like hardening the eyes to a bright light, or the ears to loud noises. All three may occasionally prove valuable accomplishments after they are acquired, but a certain per cent. of the people who try to be thus accomplished will lose their lives, or their eyes, or their ears, in the process. No doubt thousands of young girls have died of consumption caught in the attempt to harden themselves to going with bare arms and bare necks, in the costume absurdly called "full dress" by fashionable society.

Dangers to be Avoided.—In every effort to harden oneself against the influence of changes of the air, and likewise in the practice of that accomplishment after it is acquired, any saving of clothes is often more than compensated for by a waste of extra food used up in maintaining the animal heat, through the process of burning up the fatty and starchy articles of our diet. Besides this, a great and frequently an unnecessary strain is imposed upon the digestive organs, in preparing this extra supply of nutriment, and the nervous system is also severely taxed in regard to both the digestive and the heat-regulating operation, so that study or other mental efforts may be seriously interfered with. Hence the hardening process should only be applied to our bodies in the most carefully considered way, by people who are, at the time the experiment is tried, in good health, and those especially who are free from any tendency, inherited or otherwise, to disease.

When to Venture Out of Doors.—As a substitute for hardening oneself by exposure to all sorts of atmospheric changes, without carefully regulated protection, attention to the weather indications, or "probabilities," as published every day in the newspapers, has of late years become of great importance from a hygienic point of view. In fact, the study of sanitary meteorology, as this branch of the science might be called, for the purpose of determining what hygienic precautions in regard to clothing, ought to be instituted against hot, moist, or cold air, what days or what hours convalescent patients, and especially children, may venture out of doors, when is the best time for invalids to bear removal, and at what periods neuralgic and rheumatic patients must exercise particular care against exposure, has a highly practical, and sometimes an almost incalculable value.

Providing Against Weather.—Any one, by consulting the daily "indications" in the public prints, can provide against the weather correctly about eight times out of ten, but in order to avoid most of the remaining 20 per cent. of blunders, it is only necessary to combine the knowledge obtained from the signal office predictions with that derived from observations upon an aneroid or mercurial barometer, as described in the following pages.

WEATHER OBSERVATIONS.

Signal Service Bureau.—From the time the great Dr. Johnson uttered his famous sarcasm upon observers of the weather, to wit, "A certain set of men pass their lives in watching the changes of the weather, and die at a good old age with the conviction that the weather is changeable," little has been accomplished in rendering us more truly weather-wise, until the splendid results attained by our own Signal Service bureau gave a new impetus to the study of meteorology.

Value of Weather Observations.—Few can dispute that not only the hygienists of America, but also those of the Old World; are under great obligations to our National Government, which, taking timely advantage of opportunities never before presented in the history of mankind, has utilized them with marvelous success.

Weather Reports.—These opportunities consist, of course, in the cir cumstances, first, that in our American Union there is a larger compact portion of the earth's surface inhabited by civilized man, now under the same jurisdiction, and controlled by one central authority, than in any antecedent epoch; and second, that by the most extended system of telegraphic communication ever organized, it has been possible, during the last decade, for the first time in the history of the world, to obtain instantaneous and simultaneous weather reports from an area of the earth's surface occupying the whole breadth of our continent, stretching from the thirtieth almost to the fiftieth parallel of latitude, and comprising more than three millions of square miles.

Methods of Observing Weather.—Over this vast section of country signal stations have been established, under the direction of the Weather Bureau, at least wherever practicable, and to such extent as the yearly appropriation would permit. At these stations three observations are taken daily, at the same moment, the hours selected being 7 o'clock A. M., 3 P. M. and 11 P. M., Washington time.

Weather Maps.—By this plan the changes from hour to hour and day to day, as well as the effects which are produced by these alterations, are noted, and after these records are forwarded to the central office, they are reproduced in a permanent form upon the daily weather map, which is transmitted as far as practicable over the country. Hence these daily maps may justly be entitled "the geography of our atmosphere." Without examining them, we can no more secure an accurate conception of the general state of the weather than we could gain a correct idea of the real arrangement of seas, continents and islands, as represented upon geographical maps, by walking a few miles along the coast, or climbing over a range of mountains.

Storms.—By means of the extensive series of observations, carried on through several years by the United States Signal Office, it has been discovered that storms occur in areas of low barometer, rounded or oval in form, and two or three hundred miles in diameter, which travel across our country, from west to east, exactly opposite to the apparent movement of the sun in the heavens. The storm therefore is an immense ring or oval of wind, cloud and rain, which speeds across the country about as rapidly as a fast express train, that is, from about 300 to 600 miles in twenty-four hours.

Direction of Storms.—Such storms usually come to us from the Pacific coast, and by having telegraphic messages sent to Washington from several of the western stations on the Pacific Railroad, announcing at what time the storm reached each one respectively, the observers of the signal office can, of course, tell just how fast that particular tempest is advancing, and calculate when it is due in Washington, exactly as the railroad officials can tell, if they are informed by telegraph, precisely what time their train will arrive from the west. Evidently, after being thus notified, it is an easy matter for the Washington authorities to send word to the people in the neighborhood to get ready to meet the rain in one instance, or their friends at the depot in the other.

Storm Paths.—The path of an area of low barometer across the continent has been aptly compared to the track of an immense water-cart, the centre of which is, as a general rule, the line of most violent storm. The average rate of motion for such a storm-centre is 350 miles a day, although it may vary from 100 to 1200 miles in twenty-four hours. The winds commonly blow from all quarters towards the area of low barometer, the many apparent exceptions being caused by mountain-ranges, valleys, and so forth, turning aside the currents of air.

Barometric Effects.—From this it follows that, when the area of low barometer is running on a line of high latitude, the winds felt in places on its southern margin will be from the south, and *vice versa.* That is to say, if at any time an area of low barometer is passing through New York and New England, the winds in Philadelphia will, in a general way, be towards it and from the south; while, on the contrary, at any time when a similar area is traveling through Virginia and Maryland, the winds in Philadelphia will be from the north, and usually cooler. The exceptions to the rule of north winds being cooler and south winds warmer, are obviously due to large volumes of cold air or of warm air, respectively, having previously been blown to the north or south of a particular position.

Direction of Barometric Areas.—Although the general direction of the areas of low barometer seems to be round the earth towards the rising sun, their course is sometimes very irregular, as is demonstrated by the daily weather maps, which occasionally exhibit them traveling almost due north for three or four days, during which excursion they may pass over a distance of a thousand or fifteen hundred miles, before they resume their usual easterly tendency. The storm, as before remarked, is where the area of low barometer is, and as this almost always approaches us from the west or southwest, most of our storms really come from that direction. Hence there is seldom or never a true northeast storm, much as we hear people talk about "northeasters;" and a northeast wind, with rain, results from an area of low barometer situated southwest of us, and, as a rule, traveling eastward on a parallel of latitude one or two hundred miles south of our position.

Uses of the Barometer.—The use of the barometer is especially seen in determining, by its steady and gradual rise, that the edge of an oval of low barometric pressure has passed over a particular place. It also indicates, by its gradual fall, the oncoming of an area of low barometer, although when, as frequently happens, a storm lags behind this area a little, rain and wind may be most severe with a rising barometer. The indications afforded by barometric observations must therefore be specially studied for each particular place, and judiciously combined with the daily report of probabilities from the Weather Bureau, in order to gain the greatest advantage in sanitary meteorology.

INFLUENCE OF WINDS ON HEALTH.

Variety of Influences.—Wind or air in movement exercises upon human health an influence which depends partly upon its rapidity, partly upon the properties which it may have acquired from the land and water over which it has passed, and lastly upon its variations. Its influence from these various causes may be either accidental or temporary, or durable and more profound. Thus, the effect of a cold or damp wind upon an individual who is in a free perspiration, as a consequence of active exercise just engaged in, may be to produce a cold, a sore throat, a bronchitis, or an attack of rheumatism, according to the predisposition or weak point of the person. Hence, as already insisted upon, every man ought to study out carefully his own special aptitudes, under the agency of certain exciting causes, to the development of particular diseases. This is indisputably the part of wisdom, because it is far easier to avoid these exciting causes, which may so readily bring into action the dangerous maladies to which we are predisposed, if we are well informed concerning the exact defect in our armor against their power.

Deleterious Influences.—A wind, if charged with injurious substances, such as the pestilential effluvia of marshes, for example, may carry with it the causes of serious alterations in the health. Some such winds produce, in countries where they blow, diseases terrible both on account of their severity and their persistence, and which cease only with the wind which has brought them. Difference in the rapidity of the movement of the air gives rise to great variations in its effects. A moderate agitation of the air, such, for instance, as a wind moving ten miles per hour, is decidedly favorable to the proper performance of the functions of the skin, to the energetic exercise of the muscular system, and to the maintenance of an agreeable temperature. Nothing, for example, can be pleasanter, nor in their way more healthful, during the exhausting heats of summer, than the sea breezes of maritime coasts.

Sea Breezes.—When cool air is in rapid motion, however, and just in proportion to that activity, a great and speedy abstraction of heat from the surface of our bodies is perceptible. Air which in repose gave merely the sensation of agreeable freshness, becomes cold when in movement, and cold air under a similar change of circumstances becomes frigid.

Hygienic Effects of Air in Motion.—Physiologists have calculated that, with dry air in rapid motion, the loss of moisture from the surface of the skin is ten times as great as when the air is still and moist. This fact explains the necessity of avoiding, as far as possible, exposure of the body, particularly when perspiring, to air in rapid motion, because the dangers of chill are thereby greatly increased. On the other hand, a very dry wind rapidly parches the skin, checks its secretions, which are so important to the maintenance of health, and produces a general feeling of discomfort. The exaggerated condition of this prejudicial influence is seen in persons exposed to the celebrated sirocco of the Great Desert of Sahara. The influence of winds depends not only upon their humidity and their rapidity, but also upon the nature of the countries which they traverse. The wind which crosses the icy peaks or snow-clad mountain-ranges carries with it for a long distance the cold with which it is charged. The town of Nice, such a favorite resort for consumptives in the south of Europe, would have an almost perfect climate were it not for the fierce and frigid wind called the *mistral*, which occasionally visits it, blowing from the summits of the Alps down the valley of the Rhone.

Effects of Cold Air.—Cold encountered without forewarning may be the cause of disease. Too often it is a predisposing cause of disease. Cold air may of itself cause disease, as is seen in frost bite, or it may produce its results by simply making the system more vulnerable. To illustrate—it was formerly thought that cold was the cause of pneumonia. We now know that pneumonia, like many other diseases, is due to a germ. Many healthy persons have the germ of pneumonia in the secretions of the mouth. If the vitality or power of resistance is good no evil effects follow. Should the same individual be "run down" for any reason and the added influence of cold be present the germs are no longer resisted and pneumonia results.

Benefits of Winds.—But no cloud is without its silver lining, and if we but look for it, it may be found. If we examine the subject more closely we see that winds are responsible for conditions of health, that upon winds or air in motion depends the whole subject of ventilation to be discussed later. It is by the motion of the air that respiration is possible. Impure air is diluted by pure air, and then rendered purer.

OZONE.

Among the invisible ingredients of air sometimes found in considerable quantity, but not always present in any appreciable amount, is ozone.

Origin of Ozone.—Ozone is made up of three atoms of oxygen, whereas free oxygen is made of but two atoms. It is therefore concentrated oxygen, and by the loss of one of its atoms it is converted into free oxygen of two atoms.

Importance of Ozone.—As yet, the researches of medical chemists only enable us to state that the test of Shoenbein indicates that ozone is more abundant in pure than in impure air; in greater quantity at the seashore than in the interior, and in mountain air than in that of plains; absent in the centre of large towns, yet present in their suburbs; deficient in the air of a hospital ward, yet plentiful in the atmosphere outside.

Ozone in Pine Woods.—Dr. Nicholson, of Michigan, found in a long series of observations that ozone was more abundant in a pine forest than in the open country during the summer, but less abundant during the winter; less abundant in coal-pits and over swamps than in the open country, and less abundant generally in the night than in the day.

Property of Turpentine.—The results of these investigations in regard to the air of pine woods are in accord with the statements of Dr. Schreiber, of Vienna, who declares that the turpentine exhaled from pine forests possesses to a very high degree the property of converting the oxygen of the air into ozone, and this fact perhaps explains why a continued residence among the balsamic odors of the pines has long been credited with a favorable influence in cases of consumption. The test for the presence of ozone in the air, consisting of paper which has been soaked in starch and iodide of potassium, or iodide of calcium, is not reliable.

VENTILATION.

Importance of Ventilation.—Having reviewed the serious derangements to health that impure air might occasion, it behooves us to consider some preventive measures to ward off disease. The great remedy against impure air is, of course, proper ventilation.

System of Ventilation.—In arranging any system of ventilation, we may assume that the greatest amount of carbonic acid (and its associated organic material from the breath) which may be allowed in an inhabited room, without injurious results, is six-tenths of a gallon in every 1000 gallons of air, as already mentioned. The first question then is, how much fresh air must be supplied every hour for each person in a room, in order that this proportion of impurity may not be exceeded?

Quantity of Air for a Room.—By experiment and calculation it is found that, in order to keep up this admitted standard of purity, it is requisite that 3000 cubic feet of perfectly pure air should flow into a room hourly for every grown person occupying it. Of course, an equal bulk of more or less vitiated air must escape to give place to the pure air, and this bulk, which must be poured in and likewise emptied out hourly for each individual, would be equal to the contents of an apartment thirty feet long, ten feet wide, and ten feet high.

When Increase of Air is Needed.—Such a quantity, large as it seems, must sometimes be considerably increased, in order to maintain the requisite standard of purity. For example, when lights are used, and no provision is made for carrying away the products of combustion, much additional pure air is needed. An ordinary gas-burner consumes the oxygen of about twenty-five cubic feet of air hourly, and produces nearly as much carbonic acid as ten men would do in the same space of time. Sick people, especially those with diseases of the lungs, and those affected with low or putrid fevers, should have a larger quantity of pure air; and it has been found that, unless 3500 or 4000 cubic feet are supplied hourly for each patient, hospital wards, for instance, are more or less haunted by offensive odors.

Size of Apartments.—The size of apartments for human habitation should be directly dependent, within certain limits, upon the perfection of the ventilating and warming apparatus, because, if the room is small, it is only by securing a proper delivery of warm air that the occupants can receive their allotted 3000 cubic feet per head per hour, without suffering from dangerous or unpleasant draughts. For instance, in a room containing but 100 cubic feet, the air must be changed thirty times hourly, or every two minutes, in order to maintain the atmosphere at its standard purity. This would involve the necessity of such rapid currents of air flowing through the narrow space that it would be almost uninhabitable.

Objection to Small Rooms.—Besides, when the room is small, it is not possible to diffuse equally the air which enters it, because, between the inlet and the outlet, a direct current is apt to be established, so that a good deal of the fresh air passes right through, without being of any use in reducing the amount of impurity.

The Sleeping-Room.—The best authorities assert that, with ordinary means of ventilation, the space for every grown person should be not less than 1000 cubic feet, and that in this space the entire air should be changed three times each hour. According to this rule, a sleeping-room of ten feet wide, ten feet high, and twenty feet long, might be allotted to two people; and four persons, *but no more*, should sit, eat or sleep in a room twenty feet square and ten feet high, provided it was well ventilated in the ordinary way.

Frequency of Air Changes.—If the best ventilating apparatus is employed, and the air is warmed to the temperature of about 65 degrees Fahrenheit, the air in a room may be changed six times hourly without causing annoyance, so that, under such exceptional conditions, an apartment of less than half the size above mentioned, or twelve feet wide, fourteen feet long and ten feet high, would answer for four pople.

Death Rate in Small Lodgings.—The dimensions given above are, unfortunately, very much larger than are generally provided in our dwelling-houses, and in the crowded lodgings of the poorer classes the allowance of space for each person often falls as low as 250 or even 200 cubic feet. Under the latter circumstances, the increased sick-rate and death-rate, and the general aspect of what a celebrated French physician graphically describes as "physiological destitution," bear witness to the disastrous effects of breathing impure air in confined apartments.

Natural Ventilation.—A certain amount of natural ventilation, as distinguished from artificial ventilation, effected by contrivances especially arranged for that purpose, goes on all the time through the many crevices, holes and pores of our dwellings, although this supply of air is, as a rule, but a small part of what is necessary for our health. It contributes, however, to the change which does progress, whilst we sit quietly within our four walls without feeling the least draught.

Relative Weight of Airs.—Since air, like other gases, expands or contracts according as it is heated or cooled, warm air is, of course, lighter than cold air, and tends to escape at the uper part of a room, whilst its place is supplied by cold air, which flows in through every aperture in the lower portion. The familiar experiment of opening a door leading to a cold entry an inch or two, and then holding a lighted candle first near the bottom and then at the top of the crack, shows very clearly, by the way the flame is blown inward in the first instance, and outward in the second, how strong are the currents of air in these two positions.

Effects of Second-Hand Air.—Many persons, especially ladies, are so sensitive to the effects of second-hand air in a room, that they can tell in a very few minutes, by the sensations in the head and lungs, whether an agreeable amount of ventilation has been provided, by leaving the door a little way open, or whether it has been shut tight.

Effects of Differing Temperatures.—The rapidity with which the necessary interchange of air goes on through the crevices of our doors and windows depends very much upon the difference between the inside and outside temperature. This important fact is well illustrated by the following observations of Pettenkofer. He found that, in a room ten feet high, ten feet wide and twenty-six feet long, containing 2600 cubic feet, when the difference in temperature within and without was 34 degrees, the contents of the apartment changed once in an hour, through the ordinary crevices of the doors and windows. In the same room, with the same difference in temperature, but with a roaring hot fire in the stove, the change in the air increased about one-fourth. When, however, in the same room the thermometer stood at 71 degrees, whilst outside it registered 64 degrees, leaving a difference of only 7 degrees, ventilation went on only at the rate of 780 feet per hour, and even opening a window, the aperture of which equalled eight square feet, only increased the ventilation about one-half, or to 1060 cubic feet. This experiment was very instructive, showing, as it does, that a difference in temperature of 34 degrees, with carefully shut doors, windows and crevices, has as great an influence in securing a pure atmosphere as much larger and quite unobstructed communications with the outer air, when this latter is of nearly the same temperature as that inside.

Getting Rid of Foul Air.—The quickest way of getting rid of foul air in a room is by cross ventilation, or "perflation," as it is sometimes called. This is obtained by opening windows on opposite sides of the apartment when a moderate breeze is blowing; but it is a method which cannot be relied upon, because, if the outside air is stagnant, no ventilation is secured; whilst, on the other hand, if there is a strong wind, the violent current of air produced might be unendurable.

SLEEPING APARTMENTS.

Ventilating.—In all rooms which are occupied most of the day, and in all sleeping rooms, proper ventilation should be secured by artificial apparatus specially designed for the purpose, as will be described in the section of this book upon Sanitary Architecture. In old houses, until proper alterations can be made, the exit of foul air ought to be provided for by lowering the windows at the top, and the entrance of fresh air permitted by raising them at the bottom.

Preventing Unwholesome Draughts.—Unwholesome draughts may be prevented in the latter instance by the simple device of fastening a board across the window-frame on the inside, in such a way as to direct the incoming current of air upward toward the ceiling of the room. Dr. Keen's arrangement, which is still simpler and equally efficient, is to fasten with tacks or pins a piece of cloth, or even strong paper, across the lower ten or twelve inches of the window-frame, and then raise the lower sash more or less, according to the weather. The convenience of this contrivance is increased if the cloth, instead of being permanetly fastened to the window-frame, is held in its place by loops of tape, which allow of its easy removal as occasion requires.

Dangers of Neglected Ventilation.—If we but stop a moment to consider we cannot fail to see the necessity of properly ventilating the sleeping apartments. We are oftentimes surprised at the neglect of these all-important matters by intelligent people. If the air of any room becomes impure during the day we are at liberty to remove to another, and our sense of smell or perhaps a headache indicates when such a change is desirable. But during the night the senses are at rest and the individual must breath again and again the foul air of an unventilated room.

Consumption and Air.—Speaking on the subject of patients suffering with tuberculosis or consumption under treatment, Tyson states the more nearly the temperature of the sleeping-room approaches that of the outdoors the more likely is the patient to improve. The same truth holds in cases of health.

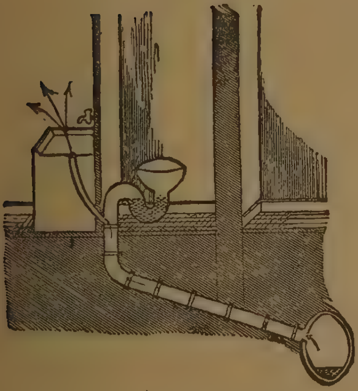
Remove Plants at Night.—Plants should not be kept in a sleeping apartment. During the night they do not give off oxygen, hence their presence is not needed. It is only under the influence of sunlight that the carbonic acid of the air is changed to carbon, which becomes a part of the plant, and oxygen which supports animal life.

CONTAMINATION OF AIR BY SEWER-GASES.

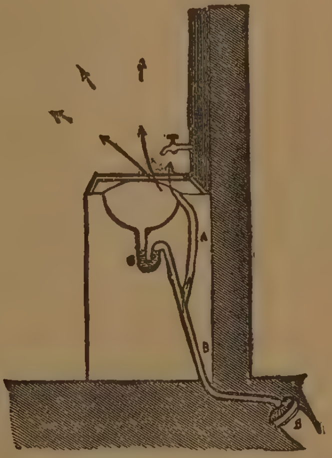
Dangers from Cess-Pool Germs.—A second great danger of impure air arises from its pollution by emanations from sewers and cess-pools, which frequently contain the germs of typhoid fever, diphtheria and perhaps other complaints, as will be more fully explained under the head of Contagion as a Cause of Disease. Dr. Letheby found that sewage-water excluded from the air and containing 128 grains of organic matter to the gallon, gave off over a cubic inch of foul-smelling gases per hour for a period of nine weeks.

Poisons in Sewer-Gas.—Of course, the danger to persons who inhale sewer-air, or "sewer-gas," as it is often called, depends very much upon whether it is loaded with disease-poisons as well as with foul odors, and the instances adduced by well-meaning but ignorant persons, for the purpose of showing that the emanations from sewers have proved harmless, are chiefly cases in which ill-smelling gases happened to be *unmixed* with the poisons of disease.

Proof of Sewer-Gas Poisons.—It would be just as well to argue that because hundreds of ships cross the Atlantic in safety every year, therefore no shipwrecks ever occur, as to contend that, because many people breathe sewer-gas with impunity, therefore it is never injurious to human health. That some sewer-gas is highly deleterious in its nature is proved by the following stubborn facts; and since we have as yet no tests for determining accurately the degree to which any particular sewer is infected with the germs of disease, our safest plan is to cut off all connection between the air of our houses and that of those dangerous channels for filth and disease-poisons.



Sewer Gas from Untrapped Washstand.



Sewer Gas from a Badly Trapped Washstand

Illustrations.—Although this subject will be considered more fully in another section, protection against the disease-poisons which enter our systems with air polluted from sewers is so important that two illustrations are here presented, showing what very often occurs. In the left-hand figure above is indicated how the untrapped outlet-pipe of a sink or stationary washstand may conduct the poisonous emanations from an adjoining water-closet, or from the sewer below, directly into a bedroom or other inhabited apartment. On the right is seen how the overflow-pipe of a trapped stationary washstand may be the avenue of dangerous or fatal poisoning by sewer-gas, as in some of the instances next mentioned:

Diptheria from Sewer-Gas.—Dr. William N. Thursfield, of Birmingham, England, reports in 1878 tracing an isolated case of diphtheria to temporary exposure to sewer-gas in a house on a short line of sewer which he *knew* to be specifically contaminated by diphtheria. This sewer, when opened and examined by a surveyor, produced in him a severe diphtheritic attack.

Typhoid from Sewer-Gas.—Dr. William V. Keating, of Philadelphia, in 1879, details at length four cases of typhoid fever attributed to sewer-gas from untrapped drain-pipes, and refers to cases of measles, scarlet fever and diphtheria in two other families apparently from the same cause.

Dr. C. W. Chamberlin, of Hartford, relates a remarkable case of fatal erysipelas in 1880, seemingly due to sewer-gas from a waste-pipe carelessly left open beneath the bed of the patient.

Vomiting from Sewer-Gas.—Dr. George Wilson quotes the account of twenty out of twenty-two boys of Clapham, England, who were attacked, and two of them died, with violent vomiting, purging and fever within three hours after standing over a choked-up drain, watching the workmen cleaning it out.

Other Examples of Gas Poisons.—Nor are these isolated instances, for the medical journals of America and Europe record numerous similar examples of dangerous or fatal effects from disease-poisons in sewer-air when inhaled by human beings.

Avoiding Sewer Poisons.—In view of this great body of evidence, showing the direct conveyance of disease by air from sewers, it behooves us all to avoid the access of such noxious effluvia into our houses, or into any inhabited place whence they can penetrate into the lungs, which are the usual avenue of entrance into human systems.

Remedies for Gas Poisons.—Such a desirable object is probably best accomplished by mercury seal-traps, which form complete metallic bars to the entrance of foul air and disease-germs. When these improved mechanical appliances cannot be obtained, ball-traps or ventilated U and S traps, if faithfully disinfected at short intervals with a strong copperas solution, 8 ounces to the gallon of water, or with chloride of lime or solution of carbolic acid, 4 ounces of Calvert's No. 8 to the gallon of water, afford safeguards which should be far more generally employed.

DUST IN THE AIR AS A CAUSE OF DISEASE.

Solid Particles.—Dust of various kinds floating in the air, and often occurring in such minute particles that it can only be recognized in a bright sunshine, or by the aid of a beam of electric light, as Professor Tyndall has shown, is a far more potent cause of disease than is generally supposed.

Danger of Saliva-Loaded Dust.—Although affections of the stomach and bowels are often induced by the introduction of particles of injurious dust swallowed with the saliva, diseases of the lungs are chiefly to be dreaded when air loaded with substances which are mechanically or chemically noxious find their way to the delicate mucous membrane which lines the recesses of our pulmonary organs. Bronchitis, catarrh and acute or chronic pneumonia, the latter often running on into one form of consumption, are especially to be guarded against in persons who are liable to be forced to inhale dust of various kinds.

Unhealthy Trades.—The effects of dust are chiefly dependent for their severity on the large amount of the offending material, and the angular, rough and hard character of its particles. A large number of the unhealthy trades are insalubrious especially from this cause. Thus, for example, it is stated by Mr. Simon that, excepting in one locality, 300,000 miners break down in England prematurely from bronchitis and pneumonia caused by the atmosphere in which they live. The one exception is most important, because it occurs among the colliers of Durham and Northumberland, where the mines are well ventilated.

Coal Dust and Consumption.—The sharply-angular fragments of coal which may be seen under a microscope to constitute coal-dust, mechanically irritate the lungs of those who inhale them, and often give rise to the kind of consumption which is so peculiar that it is called miners' consumption or miners' phthisis. This malady alone cuts short the days of an immense number of laborers among coal-dust, and after death their pulmonary organs are found filled with sharp particles of coal, which being inhaled with the breath, become imbedded in the substance of the lung, and then acting like a vast quantity of tiny splinters in the flesh, give rise to innumerable minute boils or abscesses, by which the breathing apparatus is actually riddled with holes, and so much of it destroyed that the poor sufferers die for want of lung-substance enough to supply properly their blood with air.

Saw-Grinders' Consumption.—The fine particles of steel and of sand thrown off in grinding saws and other tools, give rise to saw-grinders' consumption, particularly when dry-grinding is resorted to, and unless the dust is carried away from the workmen.

Particles of Deadly Dust.—In manufacturing these various steel and iron implements, the rough articles are firmly pressed against grindstones, which are revolving sometimes at the rate of three thousand times in a minute. Practically it is found that the degree of danger to the workmen thus employed depends partly upon the amount of dust inhaled, partly upon the character of the particles composing this dust, and partly upon the constrained attitude which the workmen are frequently compelled to assume.

What Dust Most Dangerous.—The grinding of needles and forks is the most dangerous, because it must be done upon dry grindstones, in order to reduce the chance of the fabricated utensil becoming rusty. Scissors, razors and table-knives can be ground partly upon wet grindstones, so that the men employed in such work run less risk of injury from it, whilst the coarser implements generally are now, as a rule, finished upon wet stones entirely, so that still less danger is incurred.

Grinders' Asthma.—The grinders' consumption, called also the grinders' asthma from the difficulty of breathing, which is one of the prominent symptoms, comes on very gradually, and often lasts four or five years before it proves fatal. At first there is only a little dry cough, with scanty expectoration; later on the mucus, which is coughed up, begins to be reddish from a minute quantity of blood mingled with it; and, although there is no fever, and the strength and appetite remain good, an examination of the chest with the stethoscope reveals serious trouble in one or both lungs.

How Recovery is Possible.—Still, recovery is not only possible, but probable, at this stage of the complaint, if the workman can be persuaded to abandon his occupation; but if he persists in exposing himself to the perils incurred by breathing these dangerous dusts into the lungs, the pulmonary structure soon begins to ulcerate away, and painful, lingering death by consumption follows.

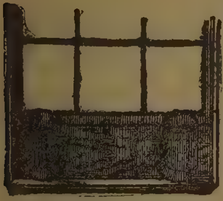
Average Life of Grinders.—Until recent improvements in regard to grinding, the fatality of these particles of dust, when inhaled into the lungs, was very great. According to Dr. Holland, the average age at death of twelve workmen at the trade of needle-grinding was only thirty years and eight months, and other authorities give the duration of life as from thirty-one to thirty-five years.

Nailers' Consumption.—In Wheeling, West Virginia, the dust of nail-factories is so injurious that "nailers' consumption" is very common, and certain life insurance companies refuse to insure any operative in the grinding department of the works.

Use of the Magnetic Plate.—In factories where steel-grinding goes on to a very great extent, the use of a large magnetic plate, for drawing to itself the metallic particles, is very useful; but, of course, it has no power to purify the air from any injurious dust, except that made up of iron or steel, and perhaps on this account it has never been popular among the workmen.

The Mouth Filter.—One might suppose that it would not be difficult to devise a mouth-filter or mask to be worn over the face, and exclude the dust, whilst allowing the purified air to enter the lungs. Practically it is found, however, very difficult to construct a piece of apparatus of this kind which will keep out the dust, and yet remain unobstructed by the moisture of the breath, which condenses upon the material of which the filter is made.

Use of the Face Mask.—Dr. Richardson, of London, has arranged a very ingenious mask for this purpose, which is fitted with a breathing tube, around the inside of which feathers are rolled in such a position that when the air is drawn through the tube they will rise up and filter it, and during the reverse process of expiration, they will be flattened down against the sides of the tube by the current of air, and leave an open channel for it to be breathed out. By this plan it would seem that lightness, dryness, good filtration and self-cleansing of the filtering material would be secured; but, strange to say, it has not been approved by those who wear it. The workmen complain that it causes closeness of the air and looks unsightly, but it certainly merits a more extended trial before being abandoned.



Maine's Elbow Tube Ventilator.

Use of the Mechanical Fan.—Another very efficient method is to draw away the dust in the strong current of air created by a powerful mechanical fan. A single fan may be made to extract the dust from several grinding-stones, care being taken to have the opening in the boxes which surround the stones and in which the draught is set up underneath, so as to extract both the heavier and lighter particles. This plan adds materially to the expense of manufacture, and is therefore not very popular among the mill-owners, but it so greatly diminishes the dangers to the workmen, when properly adapted, that its employment should be enforced by law, in order to protect the health of the operatives.

Danger from Wet-Grinding.—Although the introduction of wet-grinding for the coarser tools vastly decreases the chance of mechanical injury to the lungs from floating particles in the air, the artisans are often kept covered with the muddy water which is constantly being whirled off from the stones. Being thus exposed to the combined evil influence of cold and wet, they are especially subject to acute bronchitis, pneumonia and rheumatism, which may, however, be in part prevented if the men wear water-proof clothing whilst they are at work.

Pottery Dust.—In the pottery trade there is often a large amount of dust made up of mineral particles, which are very irritating to the lungs of the operatives employed. The same may be said of the artisans who work at the trade of glass-making, the most dangerous department being that of grinding and polishing the cut-glass. Of these men more than one-third are said to die of consumption, and their average age at death is variously estimated at from thirty to forty-two years.

Flax Dust.—In flax factories a very irritating dust is produced in the processes of hackling, carding and tow-spinning, and Dr. Greenhow states that, of 107 operatives examined indiscriminately, no less than seventy-nine were suffering from bronchial irritation, and in nineteen of these cases there had occurred that serious symptom of consumption, bleeding from the lungs.

Cotton Dust.—In the carding-rooms of cotton, flax and silk-spinners there is also a large amount of dust and loose vegetable fibres, which frequently set up dangerous irritation in the lungs of the workmen, who breathe the air thus loaded with injurious impurities.

Match-Makers' Diseases.—The makers of matches, who are exposed to the fumes of phosphorus, suffer from a form of ulceration of the jaw-bone, if there happens to be any uncovered portion upon which the poisonous vapor can act, as for instance, around the root of a diseased tooth. The manufacture of many chemical products is exceedingly dangerous to health, and requires special precautions to reduce its evil influence as far as possible.

Danger of Metal Fumes.—In some trades and under certain circumstances the fumes of metals or particles of metallic compounds pass into the air, and render it very injurious to health for those who happen to breathe it. Brass-founders are affected with bronchitis and asthma, as in other trades where dust is inhaled by the workmen, but in addition they suffer from a disease called brass-ague or brass-founders' ague. It appears to be the result of inhaling the metallic fumes, perhaps of the oxide of zinc.

Symptoms of Fume Poison.—The symptoms are tightness and oppression of the chest, with uncomfortable nervous sensations, followed by shivering, an indistinct hot stage, and lastly profuse sweating. The attacks, unlike those of genuine ague, are not periodical. Coppersmiths are apt to be affected in a similar way by the fumes arising from the partly vaporized metal or from the solder. Tin-plate workers likewise suffer occasionally from the fumes of the soldering.

Plumbers' Poison.—Plumbers are liable to inhale the volatilized oxide of lead which rises during the process of casting or in soldering; nausea and a feeling of oppression about the chest are the first symptoms, and afterwards colic and palsy, especially of the wrists.

White-Lead Poison.—Workmen in white-lead manufactories often suffer in the same way from inhalation of fine powder of white lead, chiefly from the beds in which oxidation goes on and in the process of packing the product. And the same may be said of house painters to some extent, although lead poisoning is more apt to occur in them from swallowing the lead compound in consequence of want of cleanliness while taking food.

Tobacco Dust.—Operatives in tobacco factories sometimes suffer from irritation of the throat, nose and eyes by the tobacco dust, and there are some people who cannot become accustomed to an atmosphere of the weed. The greatest irritant effect seems to be produced in the manufacture of snuff, but with the large majority of operatives, if proper care and ventilation is secured, no serious effects result after the first few weeks or months.

Mercury Poison.—Workers in mercury, artisans who silver mirrors and those who handle the amalgam of mercury and gold used for gilding silver articles in some cases are very apt to be affected with a peculiar disease called mercurialismus. This complaint appears to be the result of the poisonous action of mercury upon the mouth, the teeth, the bones, and so forth.

Arsenical Poison.—Workmen who handle compounds of the poison metal arsenic in the manufacture of wall paper, and women engaged in artificial flower-making where arsenical colors are employed, very generally suffer from the effects of arsenical poisoning in consequence of inhaling the dust of this poisonous metal.

Wall-Paper Poisons.—Perhaps the most common kind of poisoning from a metallic dust inhaled with the air is that developed in persons who spend much time in rooms decorated with arsenical wall papers. In some instances, these brilliant yet treacherous decorations, which may be either green, purple or brown in color, have been found to contain as many as thirty-seven grains of the arsenical compound to the square foot, and numerous well-authenticated cases of serious injury to health from inhalation of the atmosphere of rooms in which this arsenical dust was constantly floating are on record. Whenever a person who occupies a room papered with green or purple hangings begins without any obvious cause to suffer from headache, nausea, inflammation of the eyelids, dry cough, muscular tremors and impaired nervous power, the cause should at once be sought for upon the walls of the apartment, and if the usual chemical tests show the presence of arsenic in a little of the paper which has been scraped off, both the patient and the paper should be promptly removed.

PREVENTIVE MEDICINE.

PART III.

FOODS AND DRINKS.

GENERAL CONSIDERATION.

Object of Food.—The object of food is primarily to furnish the means for growth, repair, heat and energy. The mere gratification of appetite, which to the detriment of health too often is regarded with undue prominence, is a secondary consideration and merely incidental to nature's demand for nutrition.

Food, Half of Life's Battle.—It has been said that "food properly chosen, properly cooked and properly eaten is half the battle of life," and the practical value of the subject will readily be understood when it is considered that it plays an important part, not only in maintaining health, but in modifying and curing diseases.

The Problem of Diet.—If all members of the human family were alike it is obvious that a bill of fare could soon be arranged which would give every person the most perfect nourishment; but as we each differ, in some smaller or greater degree, from all others of our fellow men, it is necessary to study the problem of diet, as modified and limited by our own individual peculiarities and surroundings. Age, sex, occupation, climate, nationality, and so forth, all influence the quantity and the character of food required, and, on the other hand, the amount and nature of food taken govern to no little extent the temperament and characteristics of people. Prior expresses this truth poetically when he says:

"Was ever Tartar fierce and cruel
Upon the strength of water gruel?
But who can stand his rage and force
If first he rides, then eats his horse?
Salads and eggs and lighter fare
Tune the Italian sparks guitar;
And, if I take Don Congreve right,
Pudding and beef make Britons fight."

How Food Affects Races.—It has been pointed out, and doubtless with some truth, that racial distinctions are in a measure the result of the character of the food taken, and that the Irish and the Hindo would not have submitted so supinely to the rule of England had their diet, which consists chiefly of vegetables, been more highly nutritious like that of the British.

PHYSIOLOGY OF NUTRITION.

How Food is Appropriated.—In considering the subject of food, it is important to understand the method by which it is appropriated by the system and converted into blood, flesh, bone and other tissues, and how it is utilized in the generation of heat and force.

Change of Fluids and Tissues.—During our whole lives the fluids and the solid tissues of our systems are constantly undergoing change. New materials in the form of infinitely minute particles of muscle, nerve, and so forth, are being produced, while the old and worn-out atoms of these structures are removed with ceaseless activity. While this incessant movement of these constituents of our bodies is not perceptible to the eye, even when aided by the most powerful microscopes, it nevertheless goes on, and must go on as long as life continues. In fact, the researches of physiologists tend to show, with a large amount of certainty, that the health, strength and vigor of the whole and of every part of the body is in proportion to its youth and newness. Thus it is that exercise, under due regulation and management, is a hygienic means of such great value in strengthening and developing the whole frame, especially the muscular system.

Relation of Natural Forces.—In endeavoring to reach the "bottom facts" of our knowledge in regard to the forces we derive from the food taken into our stomachs, we must bear in mind that, in our own bodies, as in the whole universe around us, we have, from a scientific point of view, to deal only with material entities of various kinds and properties which we call matter, such as the chemical elements oxygen, carbon or sulphur, and their compounds; and principles of action, which we denominate forces, among which may be instanced heat, electricity, and the attraction of gravitation, as types.

Natural Forces.—The doctrine of the correlation of forces, abstruse as it sounds at first, is simply, as regards two of them, namely heat and mechanical motion, an extension of the commonly observed fact that motion, by causing friction, produces heat, as we see in using an ordinary Lucifer or friction match. Every time we strike a match we demonstrate that motion may produce heat; and to expand this idea into the doctrine of correlation (or relationship) of forces, it is only necessary to prove by careful and ingenious experiments, as was first done by Mr. Grove and Mr. Joule, that any certain amount of motion applied in any conceivable way to the production of heat, causes always exactly the same amount of heat, and contrariwise, a particular quantity of heat applied to the production of motion, originates always the same quantity of movement, no matter by what kind of machinery it is applied.

Heat and Motion.—In this way we can, by mechanical experiment, establish the existence of a correlation—or, to use the more familiar word introduced above, a relationship—between heat and mechanical motion, and this relationship has been found to be that the force of a weight of 772 pounds falling one foot would, if converted into heat, raise the temperature of one pound of water one degree of Fahrenheit's thermometer.

Muscular Effort.—After clearly comprehending this idea, it is only necessary to grasp the further suggestion that, if a man is hired to lift up again the weight of 772 pounds, which in falling one foot gave us our unit of heat (namely, the heating of one pound of water, one degree), we further establish, by the additional experiment, a relationship or "correlation" between the number of muscular efforts he is required to make and that same heat unit.

Food Required.—Lastly, if we weigh the extra beefsteak or half-peck of potatoes he needs to eat, to enable him to perform so much extra labor, we find out the equivalent in ounces of food for the requisite amount of muscular exertion employed, which is again the equivalent of the mechanical motion produced, and this in turn is the equivalent of our (arbitrarily assumed) unit of heat, the quantity of heat which will raise one pound of water one degree.

The Four Natural Forces.—Thus, even those readers who make no pretensions to scientific culture can, it is hoped, understand the nature of that mutual relationship or correlation which exists between these four natural forces, to wit, heat, mechanical motion (of falling or lifted weights), muscular exertion and food.

What Food Is.—Food, then, is any substance which, when taken into the animal body, may enter into such new chemical combinations that it gives out its dormant force in the form of heat, muscular movement, nerve power, and so forth.

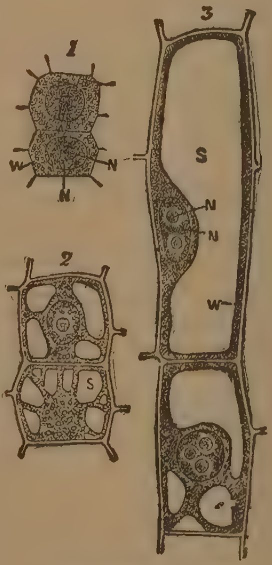
How Food Nourishes.—If an article of food is completely combined with oxygen in the human system, it yields up all the force which it is capable of affording; but if it is not so adapted to the wants of the body as to be fully oxidized or burnt up, part of its force passes off with other refuse matters, and is wasted, as far as that man's nutrition is concerned. It is by learning how to avoid this waste, as well as to escape the injury, excess of undigested food is apt to cause to the digestive organs, that a careful study of the articles of diet suitable for each individual, in accordance with the facts and conclusions detailed below, may be made so profitable and beneficial to every one.

STRUCTURE OF ORGANIZED BODIES.

Cell Organization.—All animals and vegetables are built up of minute, separate, organized bodies, called cells, which are put together like stones in a pavement, so as to form the skin, the muscles, the nerves, and so forth. The cell-elements or cells are made up of a nucleus or central living mass, which may be aptly compared to the yolk of an egg.

Protoplasm.—Around this nucleus is gathered a little lump of formed material or protoplasm, corresponding to the white of an egg, and the whole is enclosed in a delicate membrane resembling that which lines the egg-shell. These cells are extremely small, varying from one four-thousandth of an inch to one five-hundredth of an inch in diameter. In the epithelial scales or cells, which are packed together to form the skin, as already mentioned, the average diameter is about one fifteen-hundredth of an inch.

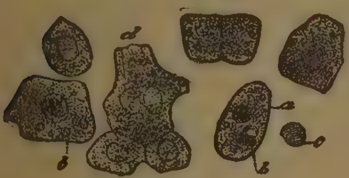
Plant Cells.—The marginal illustration shows the cells from the root of a plant magnified five hundred and fifty times. At 1 appear two young cells with thin walls marked W, the nucleus N, and a central spot called the nucleus N′. The protoplasm of each cell is seen occupying the space around the nucleus, and within the cell-wall. At 2 are exhibited a couple of older cells, with thicker walls, having vacant spaces or vacuoles, S, filled with fluid sap. At 3 are displayed still older cells, with a further decrease of the protoplasm, which has apparently been used up in building the yet thicker cell-walls. But although



Cell-Elements of a Plant.

cells are thus seen to enlarge, the chief part of the growth of plant or animal is brought about by the multiplication of cells, which divide and subdivide sometimes with great rapidity.

Cells of Wood, Bark and Pith.—Besides increase of size of an animal by this multiplication of cells, we have differences of structure, resulting from variations in the form and composition of the fully-developed cells, such as those of the wood, bark and pith of a plant, or the muscle, nerve and skin of an animal. Lastly, by the death of larger or smaller groups of cells, are produced the decay of vegetable and the ulceration of animal organisms.



Human Liver Cells.

Building of Human Organs.—The different organs of human bodies and those of the inferior animals are built up of cells very similar to those found in the vegetable kingdom, as is illustrated by the adjoining figure. This cut shows the liver-cells of man, with the nucleus, *a*, and oil-drops, *b*, in their protoplasm. At *c* is depicted a free nucleus, that is, one from which the cell-wall and the protoplasm have been accidentally torn away; and at *d* is shown a large cell with two nuclei, illustrating the tendency to occasional twin-formation, which seems to run throughout all animated nature.

First Step Toward Human Development.—The first step toward the development of a new being in that wonderful yet hourly miracle of reproduction, as, for instance, of a young chicken inside an egg, is the division of the yolk into a great number of little rounded parts, which soon present the appearance of a heap or mass of cells, which for a time cannot be distinguished from the white cells in the blood of the parent hen. Gradually, however, as the operation of hatching progresses, certain groups of these cells vary under the influence of the vital force from other groups, until, by a continuing process of development, the liver, the heart, the skin, and so forth, are completely formed.

Cell Nourishment.—In chickens, and birds generally, the young creature is nourished until large enough to pick up its own food by the contents of the egg, but in animals which bring forth their young alive, a curious natural provision is made for supplying the requisite nourishment from the blood of the mother. After birth, however, the necessity for food immediately becomes apparent, and in order that mere existence shall continue, external nourishment of some sort must be regularly supplied. Furthermore, if growth and complete development are to go on, this nourishment must be accurately proportioned in kind, quantity and composition to the exact needs of the infant animal or man.

MIXED DIET REQUIRED BY MAN.

Analysis of cow's milk shows it to contain—

Albumen and casein	54.05
Butter	43.05
Milk Sugar	40.37
Salts	5.48
Water	857.05
Total	1,000.00

While this forms a suitable diet for young children, who, though rapidly growing, expend in labor comparatively little muscular force, it fails to meet the requirements of active adult life.

Kinds of Diet.—Nor, notwithstanding much argument to the contrary, does an exclusively vegetable diet seem best adapted to man's needs. The evidences derivable from the form and arrangement of the teeth, the structure and functions of the alimentary canal, and the results of direct experiment, all indicate that, in the present age of the world at any rate, mankind thrives best, as a general rule, upon a mixed animal and vegetable diet.

Amount of Food Required.—The requirements of a full-grown individual may be estimated by accurately determining, as has been done by scientific men, the quantities of the chemical elements carbon, hydrogen, nitrogen and oxygen, which are cast off from the body by the bowels, the kidneys, the skin and the lungs, every twenty-four hours, and then calculating what quantities of various articles of food, containing these chemical elements, must be eaten daily to supply this waste.

What Foods Must Supply.—For instance, if we find, as some English investigators have done, that a gang of one hundred average prisoners cast off every twenty-four hours, from their lungs, kidneys and bowels, about seventy-one and a half pounds of the element carbon, and four and a quarter pounds of nitrogen, it is obvious that carbon and nitrogen must be supplied to this amount in the food the gang of prisoners eat in order to make up far what is excreted. If they were to be fed upon bread and water alone it would require 380 pounds of the staff of life daily to keep them in good health, because it requires that weight to yield the four and a quarter pounds of nitrogen which they daily cast off in the ways just mentioned. But in 380 pounds of bread there are 128 pounds of carbon, which is about fifty-seven pounds more than would be needed to replace what these men would excrete.

Meat Food.—On the other hand, should the authorities try the experiment of giving them animal food only, it would be necessary to allow them 350 pounds of lean meat, because no less than that amount would contain the seventy-one and a half pounds of carbon necessary to replace the quantity of this element excreted; but lean meat contains proportionately a very large amount of nitrogen, and in 354 pounds of it there would be found 109 pounds, or 105 pounds nearly in excess of what the prisoners really required, and which would therefore be wasted as food.

Mixed Food.—In the former case which we have supposed, each man would have to eat about four pounds of bread, and in the latter about three and a half pounds of meat every day, in order to avoid losing strength. In the first instance, there would be a good deal of starch in the bread, and in the second case, a considerable bulk of nitrogenous material, which would be quite unnecessary as food, and apt if taken into the stomach to overload it and derange its functions.

A True Mixed Diet.—The true way is to resort to a mixed diet, and if such were to be adopted in this instance, we would probably find that 200 pounds of bread, with sixty pounds of meat, would answer every purpose. Two hundred pounds of bread contain, besides water, sixty pounds of carbon and two of nitrogen, and sixty pounds of meat about twelve of carbon and two and a quarter of nitrogen; making, it will be observed, exactly the quantity of each of the primary elements cast off by the 100 men daily as waste matter from the processes of life.

Property of Milk Food.—It is manifest, according to this calculation, that milk is not accurately suited to supporting an adult population, because it contains too little carbon and too much nitrogen to supply the waste. This excess of nitrogen is well suited to the young animal which is actively engaged in adding to its muscular development, but is not adapted to the full-grown man, who is obliged to produce force, or its equivalent, heat, by the slow combustion of carbon in his body. It is to supply this excess of carbon, beyond what exists in milk, that all the world over bread or starch which is rich in carbon, in some form, is gradually added in larger and larger proportions to the food of a growing child.

Proper Diet Lists.—Such calculations, in regard to the other constituents of our food, form a basis of the utmost value for the economical arrangement of diet lists, and the distribution of limited means, as, for example, in armies and navies, with the least possible waste of the ingredients at command.

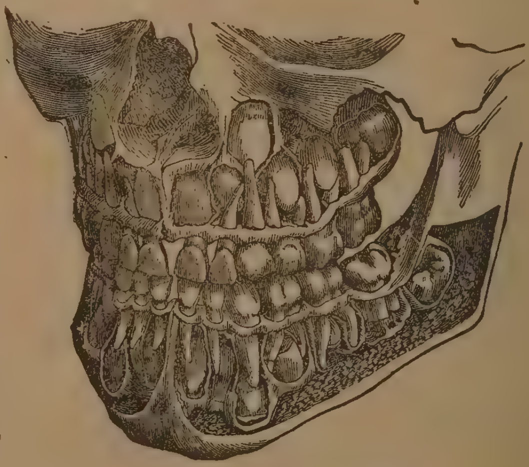
THE TEETH.

Number and Arrangement.—In the adult human being the teeth, when perfect, are thirty-two in number, and are arranged in the following order: First, in the middle of each jaw, are the four incisors or cutting teeth; next, come one on each side of the group of incisors, the two canine or dog-teeth, so-called because they are very large and conspicuous in a dog's mouth; the next pair of teeth, situated just back of each canine tooth, are named the first and second bicuspids, on account of their having two points or cusps; behind these, again, we find the first, second and third molars or grinding-teeth.

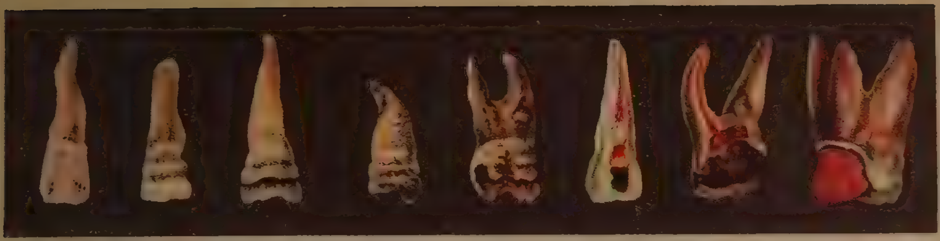
The Molar Teeth.—The last, or third molars, four in number, counting two in each jaw, of course, have received the name of the wisdom-teeth, because they appear about the time that people grow up and are supposed to have arrived at years of discretion.

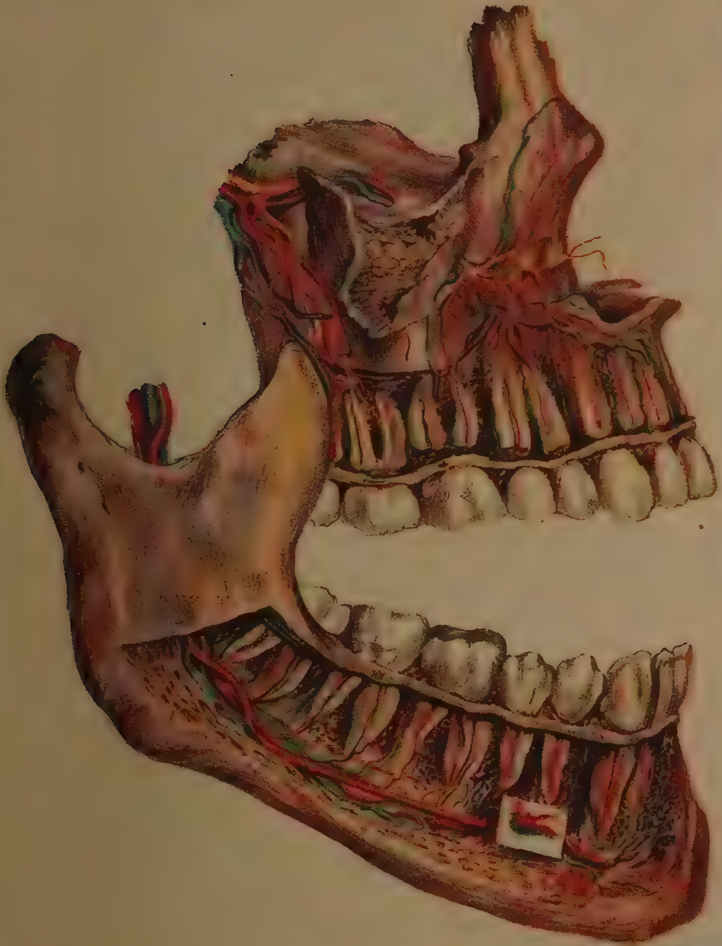
Children's Teeth.—The permanent teeth are preceded during childhood by a smaller set, only twenty in number, which are styled the deciduous teeth, for the reason that they fall out or are pushed out by the larger and stronger permanent set. These deciduous teeth begin to come through the gums of babies when they are from six to twelve months old, and unfortunately give rise to much of the pain endured in childhood. The adjoining figure shows how the second set of teeth comes in behind the first, or deciduous teeth, pushing these latter out of the jaws from the sixth to the tenth or twelfth year of life.

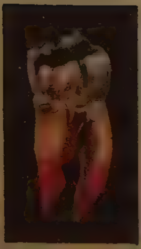
Structure of Teeth.—Each tooth has, as can be readily seen by cracking open one from a dead animal, a very hard outside shell, composed of what is called the enamel, a softer and thicker body-substance, denominated dentine or ivory, and a hollow place near the centre of this dentine, named the pulp-cavity, which during life is filled with a mass of nerves and blood-vessels. The pulps or nerve of a tooth is exceedingly sensitive, and acutely painful

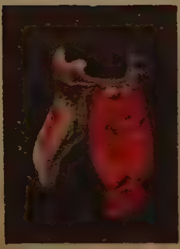


The Deciduous and Permanent Teeth.









on the slightest touch, or even from mere exposure to the air, as, for example, by the breaking off or decaying away of some portion of the dentine or tooth-bone which naturally protects it, and which when removed gives rise to toothache.

Care of Teeth.—The prevention of such suffering lies in avoiding the decay as long as possible by keeping the teeth clean, refusing corrosive articles of food or medicine, and, when cavities begin to form, having them stopped up or filled by a skillful dentist before they have time to reach the nerve.

Effect of Hard Brushes.—While frequent cleansing of the teeth is important, it is not advisable to brush them too much with hard tooth-brushes, and especially with gritty tooth-powders, thus irritating the gums and wearing away the very enamel which it is our object to preserve.

What to Avoid.—The teeth should never be used to break hard objects; hot and cold liquids, especially in quick succession, ought not to be brought in contact with them, as in drinking; and strong vinegar, syrups and sweetmeats ought likewise to be kept away from the teeth. If candies are eaten at all, or at rare intervals, the sugar remaining between the teeth and around the gums should be promptly washed away by rinsing the mouth.

THE TONGUE.

Tongue Function.—Besides being the organ of taste and the chief agent in the production of speech, the tongue performs an important duty in bringing different portions of a mouthful of food under the molar teeth during the operation of mastication or chewing. This office of the tongue is shown to be one of great usefulness, by the fact that when paralyzed, either wholly or in part, great difficulty is experienced in chewing food, because it cannot be pushed between the grinding surfaces of the back teeth.

THE SALIVARY GLANDS.

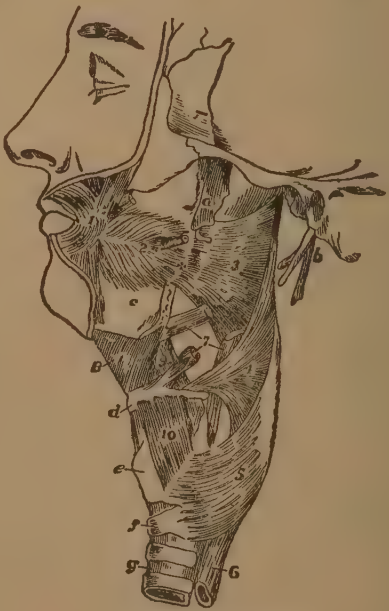
Breaking up the food into a sort of coarse powder is only the first step in its proper preparation for digestion. It must next be mixed with the liquid of the mouth, called the saliva, which has the remarkable power of turning the insoluble starch of bread and other starchy foods into soluble sugar.

Number and Location.—The salivary glands, whose business it is to manufacture the saliva, are six in number, four being situated under the tongue and the jaw, and the others seated deeply in the cheeks in front of the ears. These are called the parotid glands, and are remarkable for being the parts affected by the contagious disease named mumps.

Secretion of Saliva.—The saliva is poured out by different ducts, into various parts of the mouth, so as to become intimately mixed with the food. Its active principle, named ptyalin, plays a very important part in the digestion of the amylaceous substances, that is to say, articles of diet, such as bread, potatoes, corn, and the like, which are chiefly composed of starch.

Thorough Mastication.—It is, therefore, highly necessary that chewing should be performed slowly enough to give time for a sufficient quantity of saliva to be secreted, and to be completely mixed with the food, as want of care in eating too fast is apt to be followed by the disease called dyspepsia, as already mentioned. It is difficult to urge too strongly the importance of a thorough mastication of vegetable food.

Quantity of Saliva.—In the human being, the saliva is produced in the quantity of nearly four pints daily during health; but the secretion of this very important agent in the digestive process is powerfully affected by mental emotions, such as fear, anger or pity, and it is also largely influenced by certain medicines, such as belladonna or deadly nightshade, even in comparatively small doses.

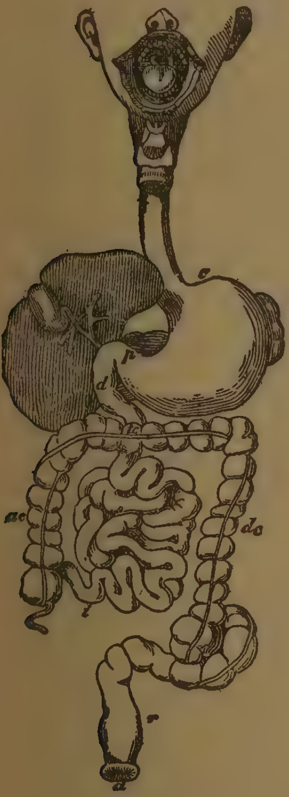


The Swallowing Muscles.

THE ACT OF SWALLOWING.

Operation of the Muscles.—The entire process of swallowing is a series of associated muscular acts, quite independent of the force of gravitation, as may be seen in animals drinking with their heads downward. Although these complex movements follow each other without any check or pause, it is common to divide them into three stages, the first of which is the voluntary one of pushing the mass of chewed food back to the upper part of the throat or pharynx, so that it is grasped by the involuntary muscles, which send it on downward to the stomach. This operation the muscles which form the tube called the throat or gullet accomplish by relaxing in front of the morsel of food which is being swallowed and contracting behind it. The adjoining figure exhibits the deep muscles of the cheek and the pharynx with adjoining parts. The circular muscle of the mouth (1) and the buccinator or trumpeter's muscle (2) help the tongue to push the food back to the upper margin of the gullet, where it is seized upon by the three constrictor muscles (3, 4 and 5) of the pharynx, and pushed down the gullet or esophagus, which is represented as being cut off at 6.

The Glottis.—In front of the pharynx is an opening into the windpipe named the glottis, through which we breathe, but which must, of course, be closed during the operation of swallowing, in order to prevent our food from dropping into it.



The Alimentary Canal.

The Gullet.—The gullet or esophagus is a muscular and membranous tube, about nine inches long, which if dissected out would look very much like a thin piece of rubber hose, such as is used for watering gardens. Its duty is to carry the food from the pharynx to the stomach, and in order that it may not get stopped up by food getting wedged in it, this pipe, in consequence of its muscular structure, has the power of contracting itself in successive portions from above downward, so as to push onward the articles of diet which are being swallowed.

THE STOMACH.

Shape.—The human stomach is a somewhat egg-shaped bag, the walls, as the substance of the bag is called by anatomists, of which are made up first, counting from the inside outward, of a layer or coat of mucous membrane which is similar to, and continuous with, the moist red mucous membrane which we see lining the mouth and throat. Outside of this is a coat of muscular fibres, some running around and others diagonally across the sack, and then outside of these again is a layer of membrane or skin.

Stomach Communication.—The stomach communicates, at its upper part on the left side of the body just below the heart, with the gullet which opens directly into it, and it empties itself, on the right side, into the upper portion of the small intestine, through a sort of valve, which has received the name of the pyloric orifice, because the word pylorus means a janitor or gate-keeper.

The arrangement of the stomach and other portions of the digestive apparatus, or alimentary canal, or alimentary tract, is well shown in the foregoing figure.

Gastric Juice.—The whole of the mucous membrane, or inner lining of the stomach, is filled with glands, somewhat similar to the salivary glands, but so small that they can scarcely be seen with the naked eye. These glands all open into the cavity of the stomach, and their business is to manufacture, from the blood which flows around them, in a network of fine blood-vessels with very thin walls, that important fluid, the gastric juice, remarkable for having such a wonderful solvent power upon the meat, eggs and other foods which constitute what is called the nitrogenous portion of our diet.

Quantity of Gastric Juice.—The quantity of gastric juice very much exceeds that of the other digestive fluids, being about a gallon and a half every twenty-four hours.

THE LIVER.

This is the largest organ in the body, being situated below the right lung. Its office is the secretion of another digestive fluid known as bile.

Bile.—About one quart of bile is daily produced, it being intimately connected with the digestion of fats. Interference with its proper secretion is largely concerned with the production of constipation and the train of symptoms ordinarily known as biliousness.

THE PANCREAS.

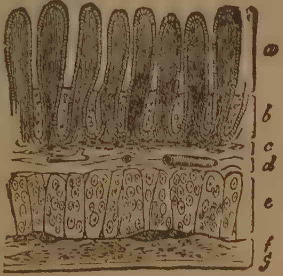
The pancreas is a long, thin gland, situated behind the stomach, and constituting, in the ox, part of what is sold under the name of sweetbread.

Pancreatic Fluid.—This is secreted daily to the extent of about a pint and a half. It supplements the action of the saliva and the bile by helping to dissolve the starchy materials and to finely subdivide the fatty substances.

THE INTESTINES.

The small intestine is a membranous pipe or tube about twenty feet long, but twisted and looped together in such a way as to occupy only the small space of a few inches in the cavity of the abdomen, which forms the lower half of a person's trunk, or body as it is often called, in contradistinction to the limbs and head. This tube is continuous with the pyloric opening of the stomach at its upper end, and at its lower extremity empties into the side of a much wider membranous tube, about five feet in length, called the large intestine.

The Large Intestine.—Most of the large intestine has received the name of the colon, and it may be justly compared to the main sewer of a city, into which pass all the waste refuse and foul materials which are of no further use, and must be gotten rid of as soon as possible.

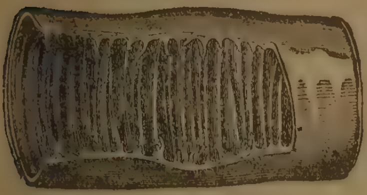


Villi of the Small Intestine.

STRUCTURE OF INTESTINAL CANAL.

Mucous Membrane.—The whole intestinal tube is lined with a mucous membrane, and in the small intestine this has its inner surface covered with hundreds of thousands of little tongue-like projections called villi. These villi are represented as they appear when highly magnified in the marginal illustration, which is a diagram of a thin slice cut lengthwise from the wall of the tube.

Folds of Membrane.—Although the intestinal canal is so prolonged as to measure, when stretched out, over twenty-five feet, its internal surface is not sufficient to perform all the work of absorbing the digested materials of diet. Hence, the lining mucous membrane is thrown into folds, as shown in the appended woodcut, simply in order, it appears, to afford surface enough for absorbing all the nutriment from articles of food, and so disposing of the substances we swallow to the best and most economical advantage.

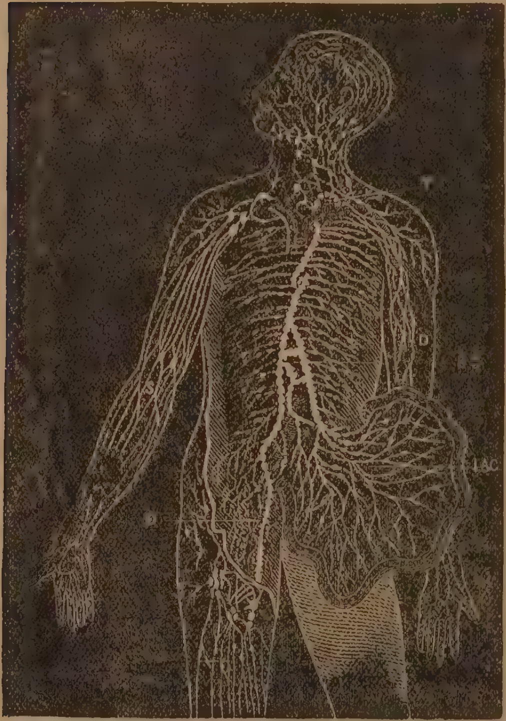


The Valvulæ Conniventes, or Folds of the Intestines.

ABSORPTION AND ASSIMILATION.

In order that the food-stuffs, when altered by the digestive process, may be of any real use to the animal economy, the nutritive materials must be distributed through the different tissues and organs of the body.

Digestion Not Sufficient.—The mere digestion of food is by no means sufficient, and no matter how much we eat, it would accomplish nothing toward keeping our muscles, hearts and brains in active operation, unless food-elements were absorbed after digestion into the blood, and assimilated from it into the very structure of all the different portions and organs of the animal frame.



The Lacteals and Lymphatics.

The Lymphatics.—As shown in the adjoining illustration, the lacteals, LAC., which take their origin in the villi of the small intestine, converge and unite together, meeting the combined lymphatics of the lower extremities in a kind of bag, called the receptacle of the chyle, which is situated deeply in the abdomen and in front of the spine, near its middle. From this the mingled chyle and lymph are carried along the thoracic duct, up to the root of the neck on its left side, where they are poured into the large veins, and so mix with the blood and become a part of that vital fluid.

Distribution of Nutriment.—The nutritious principles of the food having been absorbed by the lacteals and carried onward by the lymphatics to the general circulation are now distributed to the various organs by the blood.

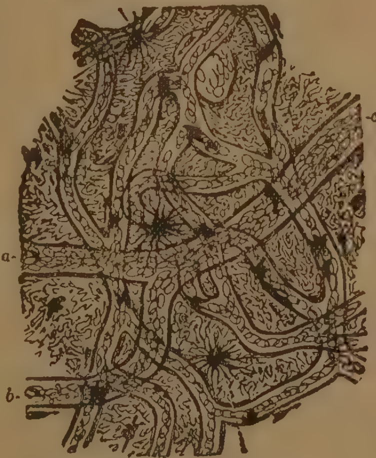
THE CIRCULATION.

Through these channels the blood is kept in constant motion by the action of a muscular pump, the heart, first passing into strong-walled branching arteries, the walls of which gradually become thinner as the branches grow smaller. These end in a network of delicate capillaries, or hair-like tubes, through which the crimson tide flows slowly into the wider, soft-walled veins, appointed to carry it back to the heart, and thus complete the round of the circulation.

Blood Function.—In its course, it receives the nutritive materials from the stomach and intestines after digestion, the special products of the liver, spleen and the lymphatic glands, and the oxygen absorbed from the air in the lungs. It therefore contains and carries to their destination all the materials required for the chemical and vital changes of the various tissues necessary to life.

Waste Material.—While passing through the capillary networks of the different organs and structures, it takes up the waste materials resulting from the wearing out and decay of these portions, and carries them to the proper point of escape from the body, as, for example, the kidneys or the bowels; at the same time the nutriment needed to rebuild the worn-out organs, is allowed to ooze through the delicate vessel-walls of the capillaries, and be diffused into the surrounding tissues.

Capillaries.—In the human being it is difficult to demonstrate the circulation of the blood in the capillaries, but the fineness of their network and the pressure of the blood which is kept up in them to force along the vital fluid may be readily shown by pricking the finger with a needle, the point of which, no matter how small it is, can scarcely fail to penetrate some minute blood-vessel, and let out a tiny drop of crimson blood. This wonderful arrangement can be most conveniently demonstrated in the thin membrane of a frog's foot, stretched out under a microscope magnifying two hundred times.



Circulation in the Web of a Frog's Foot.

Arteries and Veins.—Of the two sets of blood-vessels, the arteries, which convey the blood from the heart to the tips of the fingers and the ends of the toes, carry bright scarlet blood, and are generally deeply seated in the interior of the body and limbs, so as to be, as far as possible, out of harm's way. The veins, which lie more generally near the surface of the body, as, for example, just beneath the skin on the back of the hand and arm, are filled with dark purple blood, which is much less pure than the arterial fluid, because it contains large amounts of the broken-down materials, the ruins, as it were, of the various bodily organs, which are now on their road to be thrown away out of the system through the lungs, the kidneys and the bowels.

The Heart.—The heart has small chambers at the upper part to receive the blood, and larger, thicker chambers at the lower end, called ventricles, to pump it out. The human heart is also double, having a right side made up of a moderately strong auricle and ventricle, to send the blood to the lungs, and a powerful left side or left heart, with a thicker auricle and a very thick, strong ventricle, to drive blood to all other parts of the body.

The Illustration.—This arrangement of the two independent sides of the heart will be better understood by the aid of the diagram in the margin, which represents the two sides of the heart as separated, as they are in reality in the human breast, although there fastened together and apparently forming but a single organ. The arrows indicate the direction of the blood-current in the entire round of its circulation.

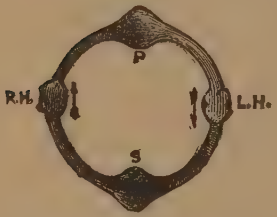


Diagram of the Circulation.

Shape of the Heart.—The human heart is a pear-shaped muscle, about the size of the fist, hollow, like a bag, but with very thick walls. It is divided inside by fleshy and membranous partitions into four parts, very much as a four-roomed house is divided into rooms by its ceiling and partitions, with communicating doors through each of the latter.

The Valves.—The valves consist of a skin or membrane hung across each side of the opening between the chambers of the heart, like curtains, in such a manner that the blood, in running one way, presses them flat against the sides of the hole, and then, as the heart's contraction attempts to drive the vital fluid back again, some of the blood is forced in behind the curtains, and swelling them out so that they meet in the middle, makes them entirely shut off the return-current of the blood.

Pulsations.—The throbbing of the heart may be felt on the left side of the body, near the lower edge of the ribs, and the beating of the pulse, which in health corresponds to the pulsations of the heart, at the wrist and over the course of large arteries elsewhere, when situated sufficiently near the surface.

Number of Beats.—In adult men these beats usually number about seventy, in women about seventy-five, and in children still more frequent; in infancy being about one hundred and twenty in a minute, and decreasing in frequency with increasing years. Within the limits of health the heart's action may vary considerably, some habitually having a rapid and others a sluggish pulse, while in the same individual such conditions as exercise, emotion, depression or even the process of digestion, may decidedly modify its frequency.

Course of Circulation.—The left side of the heart, marked L.H. in the figure, pumps the blood into the systemic arteries, and thus keeps these vessels over-filled; the larger systemic arteries, A., by their elasticity, exert continuous pressure on the blood with which they are distended; the smallest systemic arteries, A′, by their vital contractility, check and regulate the amount of blood flowing out of the larger arteries into the capillary network, and thus keep up the constant pressure or tension in the larger arteries; the systemic capillaries, marked S. C., are the portions of the vascular system where the great operations of the blood are carried on, that where the worn-out particles from all the tissues of the body are removed and the new atoms for rebuilding these same tissues are supplied; the wide systemic veins, V., are the passive channels conveying the impure blood back to the right side of the heart; the right or pulmonary side of the heart, R.H., pumps the blood into the arteries of the lungs and distends them, though less fully than is the case with the systemic arteries; by the pulmonary arteries, P.A., the blood is carried through the pulmonary arterioles or smallest arteries, P*a*, to the pulmonary capillaries, P.C., where it is exposed to the inbreathed air and exchanges its poisonous carbonic acid for the active life-giving oxygen; the letters L*h* indicate the lymphatics, ending in the thoracic duct, as already described, and receiving in their course the lacteals, L*c*, which absorb the nutriment of the food from the stomach and intestines, designated by I. in the diagram.

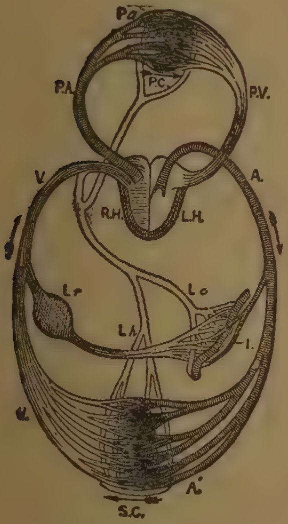


Diagram of Both Circulations.

Description of Blood.—Human blood, when exposed to the air, from which it rapidly absorbs oxygen, is of a bright scarlet color; but when deprived of oxygen it is dark purplish red. This difference is the great characteristic distinguishing arterial from venous blood, and should always be borne in mind when attempting to staunch the bleeding from a wound, since entirely different treatment is needed in the two cases.

Red Corpuscles.—The blood is not a red fluid, as it appears to be when first shed; it is composed of a watery portion, called the plasma, which has a light yellow color, and an immense number of minute corpuscles, which give to the blood its crimson hue. These little bodies, which are called the red blood corpuscles, are exhibited in different positions in the accompanying cut, as they appear when highly magnified; the illustration also shows two white or colorless corpuscles, one on the extreme left in a rounded condition, and the other at W, misshapen and entangled in some fibrin threads.

Red and White Blood Corpuscles.

CLASSIFICATION OF FOODS.

The foods may be divided into the following classes:

1. Nitrogenous substances, or proteids, which go to form the tissues of the body, and are represented by meat, eggs, the casein of milk, and other substances consisting chiefly of albumen.

2. The fatty or heat-producing aliments, which are derived from both the animal and vegetable kingdoms, although chiefly from the former; they include the animal fats, such as lard or suet, butter and the vegetable oils, among which that from the olive is the one most consumed by civilized man.

3. The carbo-hydrates, or substances containing carbon and hydrogen without nitrogen; these are the saccharine or sugary, and the amylaceous or starchy ingredients of human diet, comprising therefore sugar, molasses, bread, potatoes, beans, etc.

4. The saline or salty articles, consisting largely of common kitchen salt, with potash, lime, magnesia, and a little iron in various combinations. These ingredients of the human body, small as some of them are in amount, possess a very great importance.

Animal Food.—When men are called upon to perform any extra amount of severe labor, involving great muscular exertion, there is no doubt that an additional supply of meat is of great service.

Fatty Foods.—In regard to the functions of the fatty constituents of food, we may at once conclude that, since the diet resorted to by inhabitants of cold countries invariably contains a large proportion of fatty ingredients, these elements play an important part in the maintenance of animal heat. Indeed, it has been demonstrated by experiment that the respiratory or heat-producing powers of fat are two and a half times greater than are those of the vegetable hydro-carbons, such as starch or sugar.

Saccharine and Starchy Foods.—The saccharine and starchy constituents aid the fatty matters in developing animal heat, although they are much less efficacious in this respect. Starch is, however, capable of being rapidly converted into fat by the wonderful operations of nature's laboratory, as we see in the process of fattening pigs upon corn for market, and in this way a large store of the best heat-producing material may be laid up in the system as a provision for the winter's cold.

PREPARATION OF FOODS.

Soups and Broths.—Where economy of nutriment is an important object to be attained, it is probable that the production of broths and soups, from vegetables and meat in combination, affords many and great advantages. In making nutritious broths with a fair allowance of butcher's meat, it is advisable, when possible, to cook the vegetables separately, and the meat, if intended to be eaten with the soup, should be cut up into small pieces. In any case, the meat should be put into cold water, but should not be boiled, except when the vegetables are cooked in the same utensil, a temperature of about 150 degrees Fahrenheit being quite sufficient. If the meat is plunged into hot or boiling water at the outset, the external layer of albumen is coagulated, and the juices are prevented from exuding.

Boiled Meat.—In boiling meat, on the other hand, when the object is to retain as much as possible of the soluble juices in the meat, the piece ought to be of good size, and it should at once be plunged into boiling water, to coagulate the outside albumen. After being kept boiling for about five minutes, the saucepan should be placed aside, and the temperature allowed to lower gradually; or it may be lowered by the addition of three pints of cold water to each gallon of boiling water.

Boiled Fish.—In boiling fish, the addition of salt makes the flesh firmer and more retentive of the flavor. In cooking green vegetables, they should first be carefully washed in cold water, but not allowed to remain in it, then plunged into boiling water and cooked rapidly. Potatoes should be boiled in their skins, and after boiling for about five minutes most of the water should be poured off, and then the potatoes should be steamed.

Roasted Meat.—In roasting meat, the joint should be placed at first before a brisk, hot fire, with a view, as in boiling, to coagulate the outside albumen, and then the roasting may be conducted more slowly.

Stewed Meat.—Stewing has this advantage over dry-baking—that there is no risk of charring, and the meat is rendered juicy and tender. Tough and strong-flavored meats are, perhaps, best cooked in this way, because they can be rendered very palatable and digestible by the addition of vegetables and seasoning.

Fried Meat.—Frying is even worse than baking, unless very carefully done; but broiling on the gridiron is an excellent way of cooking chops, steaks, kidneys and small dishes of fish or fowl.

RELATIVE DIGESTIBILITY OF FOODS.

Not until 1825 was the question of the relative power of the stomach to digest different foods satisfactorily demonstrated.

Liquids.—Liquid, such as water, both pure and when containing a small amount of nutriment in solution, as is the case with beef-tea or broth, are often quickly absorbed by the lining membrane of the stomach, very much as water is sucked up by a sponge, and pass directly into the blood.

Milk.—Milk is usually coagulated or clotted as we see it when curdled by rennet, which is the dried stomach of the calf, by one of the ferments in the gastric juice, but it is commonly soon dissolved again and absorbed.

Bread.—Wheat-bread composed, as already mentioned, chiefly of starch, cannot be regarded as holding a place among the quickly digestible foods, since it has been found to require nearly three hours and a half for solution.

Eggs.—Eggs, if eaten raw, may be digested in two hours, but if boiled soft may take three hours, and if hard boiled or fried, require three and a half hours for digestion.

Meats.—Meats of various kinds differ a good deal in their digestibility; thus, for example, boiled turkey has been found to disappear from the stomach in about two hours and a quarter; boiled lamb in two and a half hours, and roast beef in three hours; while fried pork requires over four hours, and roast pork five hours and a quarter for complete digestion.

Fish.—Fish prove, as a rule, more easy to digest than meats; and the ordinary vegetables present less difficulty to the action of the stomach than bread, boiled rice being particularly manageable and requiring only about an hour for its entire solution.

Rules Regarding Meals.—In regard to the periods for eating, experience proves that habit is one of the most important agents in determining the times we ought to partake of nourishment. When a systematic regularity in respect to the period when we introduce food into the stomach is observed, the digestive processes are all better accomplished, and the food is more thoroughly and completely assimilated, than when meals are eaten irregularly

Time for Meals.—The prevailing custom in this country is to breakfast, soon after rising in the morning, on food nourishing enough to repair the exhaustion consequent upon the long fast of the night, and yet not so heavy as to overload the stomach during the morning, when the most active exertion of the day is usually performed. Whether the most substantial meal be taken at mid-day or in the evening must depend largely upon individual preference, convenience, occupation, and so forth.

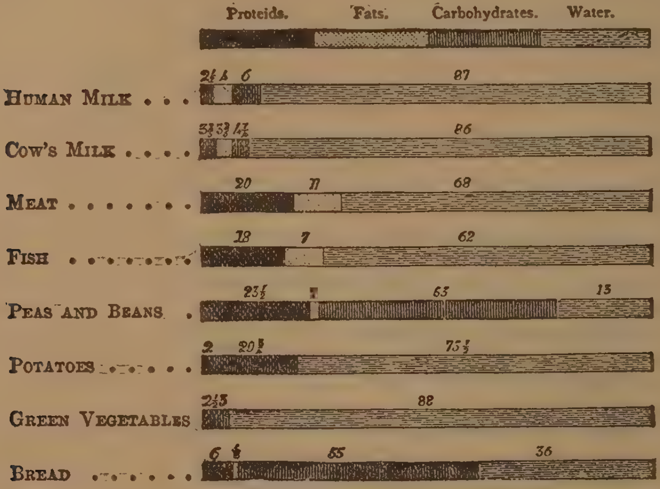
Exercise.—A very deliberate walk for half an hour or so in the open air, when the weather is not too cold, accompanied by the stimulus of cheerful, but not exciting nor absorbing, conversation, is a material aid to digestion.

Thorough Mastication.—As already indicated, the thorough mastication of articles of diet, especially by the third set of teeth, is essential to proper digestion, because, during this process of chewing, nature intends not only that the alimentary substances shall be broken up into a coarse powder, but also that this powder shall be completely mixed with the saliva, which has a powerful influence in preparing the starchy ingredients for solution. Hence persons should eat very slowly, chew thoroughly and move the mouthful of food freely about from one cheek to another, in order to amply impregnate it with the fluids of the mouth, and this precaution is particularly valuable when the food happens to be less digestible in quantity or quality than is customary.

The diagram on following page shows the percentage of the different nutritious elements of food in eight of the common articles of diet.

Effects of Overeating.—An English observer has calculated that for every death from starvation, seven occur from the effects of overindulgence in food. When the stomach is overloaded with food beyond its power of digestion, nature often relieves the abused organ by the process of vomiting, which no doubt frequently saves people who violate the laws of hygiene in this respect from the penalty of death, or at least of prolonged illness. When, however, the digestive organs are not unloaded in this manner, the ordinary chemical changes, which occur in warm, moist animal and vegetable matter outside of the body, set in, and fermentation or putrefaction occur, large quantities of gas being sometimes produced.

Excess of Nitrogenous Food.—When a superabundance of proteid substances is eaten, and perhaps imperfectly digested, whilst at the same time, as often happens, a diminished quantity of exercise or labor is performed, there must almost necessarily be a disproportion between the oxygen inhaled by the lungs and the nitrogen absorbed from the food, when they meet in the blood, and therefore a disturbance of the assimilative processes. It is probable that gouty and perhaps rheumatic affections arise partly in this way, although the direct influence of certain alcoholic drinks in producing gout is indisputable.



Constituents of Foods.

Excess of Starchy Food.—Superabundance of starchy articles of diet appears to be less directly hurtful to the system, because a larger proportion of the excess passes off from the bowels in an unchanged condition. Troublesome corpulence may sometimes result, however, from eating too much starchy food, and it has been supposed that attacks of diabetes, a disease which is characterized by the presence of sugar in the urine, are occasionally due to the same error in diet.

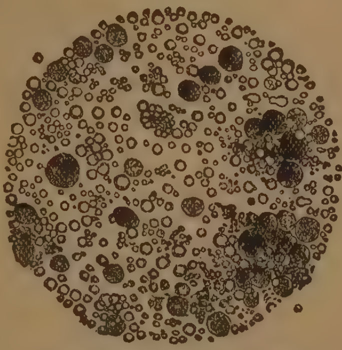
Effects of Insufficient Food.—Insufficient nourishment is followed by loss of flesh, weakness, faintness, and, if prolonged sufficiently, by extreme emaciation, hallucinations and delirium. The blood decreases in volume, the temperature is lowered, the respirations become fewer, palpitation, vertigo, diarrhœa and dysentery ensue, the eye is glassy and ulceration of the cornea occurs.

Contaminated Food.—Food is often rendered unwholesome and unfit for use by inherent disease by contamination with poisonous substances and by putrefactive changes. Moreover the peculiar power of absorption possessed by some foods, as milk, pineapples and bananas, is capable of causing the transmission of certain diseases.

Decomposing Food.—Decomposing food may give rise to alarming and fatal poisoning through the absorption of septic materials into the system. It is probable that where chemical analysis fails to reveal a cause for death, many cases giving evidence of violent gastro-intestinal inflammation or of profound impression of the nerve centres, are in reality due to such causes.

Meat of Diseased Animals.—The meat of animals affected with such diseases as pleuro-pneumonia, murrain, anthrax, tuberculosis, Texas cattle fever and parasitic affections, as tape worm and trichinosis are unfit for food, and precautions observed to guard against their employment.

Adulteration of Milk.—The results of the adulteration of milk are mainly those caused by withholding certain nutritious principles from the food supply. Their evil effects are seen particularly in infants fed upon cow's milk, who are thus deprived of much that is necessary to their subsistence and growth. The skimming of milk, or the addition of water, are alike productive of this result.


Human Milk Containing Colostrum Corpuscles.

Transmission of Disease by Milk.—The results of investigation into the causation of numerous epidemics and isolated cases of contagious diseases have shown conclusively that some of these are capable of being conveyed through the agency of milk. By carelessness in cleansing dairy utensils, by feeding cows with contaminated food and watering them from stagnant or infected pools and by exposing the milk to foul and poisonous emanations, milk may become a source of danger to those who take it. Among the diseases which have been often spread in this way are the following: Tuberculosis, typhoid fever, scarlet fever, diphtheria, and so forth.

PREVENTIVE MEDICINE.

PART IV.

OUTWARD ENEMIES OF HEALTH.

Heat and Disease.—Heat becomes a predisposing cause of disease as soon as the temperature rises above 70 degrees or 80 degrees. When it begins to affect healthy life the pulse, the heart action and respiration are quickened. The skin and lungs are unable to equalize temperature, and the condition of the entire body becomes one of susceptibility to disease.

The Sun's Heat.—Exposure of the body for long periods to the heat of the sun is apt to result in more or less serious disturbances, such as congestions, brain hemorrhages, meningitis, etc. Hence the need of protection against the direct rays of the sun.

Sunstroke.—Sunstroke, or thermic fever, is the result of exposure to heat rays. Its early symptoms are faintness, thirst, great heat and dryness of skin, with prostration. As quickly as possible the body should be subjected to the ice or cold water treatment to neck and head.

Traveling in Hot Climates.—Do not travel during the heat of the day. Protect the person by some covering which will reflect the sun's rays. Rest during the mid-day hours. Content yourself with a scanty, unstimulating diet. Use gently stimulating baths. Wear thin, light, loosely-fitting clothes.

Cold as a Disease Producer.—Cold becomes a disturber of bodily function as soon as it falls to a temperature which ceases to be agreeable. The tissues shrink, the capillaries grow sluggish, perspiration is suppressed, sensibility is impaired.

Sudden Cold.—Sudden falls of temperature are marked by a long train of diseases, or by aggravated or fatal turns to existing diseases. This is particularly true of consumption, catarrh, influenza or grippe and bronchitis.

Cold and Elderly People.—From thirty years on the human body begins to draw on its surplus power. This power is constantly diminishing as we age. Hence cold affects the aged most seriously by calling largely on a diminishing power. It is difficult to sustain a "blood heat."

Cold and Perspiration.—Cold produces disease by checking perspiration, thus preventing the escape of injurious materials from the blood, and throwing more work on kidneys and lungs, which often become overtaxed.

Cold and the Blood.—Cold tends to drive the blood from the blood-vessels to the surface, thus filling one or more of the circulating organs too full of blood. If any of these vessels be weak the man is handicapped in his battle against disease.

Clothes.—The body loses heat by radiation, by evaporation, by rapid air movement. Hence the necessity for clothing, which cuts off radiation of heat, interferes with the evaporation from the body, and limits the conduction of heat by rapid air movements. Clothing, therefore, plays a most important part in warding off diseases and disease-producing conditions.

Regulation of Clothing.—Garments worn next the skin should be of wool or silk, as best absorbents of perspiration, and as non-conductors of heat. Weights may be light or heavy according to the seasons or different constitutions. White or gray clothes are preferable to black, when one is subjected to direct solar heat.

Poisoned Clothing.—Clothes made of dyed materials are sometimes injurious to health, as containing poisons. This is particularly so of bright colored stockings or underclothing.

Local Injuries.—Cold gives rise to painful local affections, such as frost-bite and chilblains, the former involving the nose, ears and fingers, the latter the feet. Heat applications in any of these cases must be avoided. The cold treatment is best.

Light.—Light has a powerful effect on the system, through both the blood and nerves. It is, therefore, an active agency in the generation of diseases and their cures. It is the essential of all growth, and particularly affects the outer tissues as well as the internal organization.

Light and the Eyes.—Light for the eyes should be carefully graduated, so as to prevent impairment of vision. It has the effect, if profuse, of rendering the eyes sensitive, so that they cannot bear the effects of even subdued daylight without pain.

Colored Light.—Many advantages are claimed for colored light. Blue and green lights are preferable to orange, yellow or red for the eyes. Certain of the colored lights act beneficially on animal and vegetable growths, and have a great influence in hastening the cures of certain diseases.

Electricity.—Electrical conditions of the atmosphere have a direct effect on the human system. On the approach of a thunder storm, one may frequently notice a difficulty of breathing. Rheumatics are painfully affected, neuralgia is intensified. Many existing maladies are aggravated by electrical conditions.

Electricity in Medicine.—As a medical agent electricity has grown rapidly in favor. As a remedy for many nervous diseases and for pain the galvanic battery has come into quite general use. It is a clean, convenient and safe remedy. It is also economic, for the cost of an electrical machine is within the means of most every one, and it can be self-operated. For the X-ray consult index.

Climate, Soil and Health.—It is not alone in temperature that climates differ from one another, and are endowed with the power to check or engender diseases. Into its influences on the human body must enter all the manifestations of humidity, tempest, fog, dew and wind directions.

Diseases Affected by Climate.—Among the diseases favorably affected by a change of climate are consumption, bronchial affections, diseases of the throat, asthma, chronic gout and rheumatism, dyspepsia, kidney affections, especially Bright's disease, and neuralgia. The advantages of a climate where sea air abounds, or where the air is rarefied and dry, are fully recognized by medical men.

Soils.—These affect health in the most direct manner, and through their mineral, animal and vegetable matter, also their air and water. Diseases connected with moist soils are of almost every type, rheumatism, catarrh and typhoid being most general. Moist soils are favorite breeding places for germs affecting health, and drainage systems should be made as perfect as possible.

Contagion.—The subject of contagion is one of popular notoriety and apprehension. Certain receptive conditions, or a predisposition, the nature of which is as yet unknown, exist in individuals, which appear essential to the development of the specific poisons, and the establishment of the disease. An immunity against the repetition of a malady is generally conferred by one attack of a contagious disease. This safety has been proved real upon an enormous scale in regard to small-pox, and, in relation to the other contagious disorders, a belief in such immunity from second attacks is founded upon very extended observation; but the protection acquired by a first attack of any of these diseases is of no avail against the rest. Measles, for instance, renders the human body proof, as a rule, against measles, but leaves it as open to small-pox as before, and so on with all the rest.

Morbid Poisons.—With regard o the coöperative effect of fermentation, putrescence or decomposition there is some reason to believe that it may quicken the activity or facilitate the development of specific morbid poisons in the way of a predisposing cause to their reproduction. There is no small amount of circumstantial evidence tending to show that conditions of this kind may be thus favorable to the propagation of specific diseases, even to the extent of rendering them epidemics, in consequence of the predisposing agency of putrefying emanations.

PREVENTIVE MEDICINE.

PART V.

THE GERM-THEORY OF DISEASE.

Antiquity of the Theory.—In order to make the sanitary precautions thus rendered advisable clearly understood, it should be explained in the first place that the germ-theory of disease, traced by some to the celebrated Pliny, vastly extended by the renowned botanist, Linnæus, more than a century ago, and since placed upon a scientific basis, particularly through the labors of the celebrated Pasteur, of Paris, and Professor Koch, of Berlin, to whom more than to all of their co-laborers in this important field beongs the honor of proving what had long been suspected, the relation of microörganisms to disease, and removing this subject from one of theory to one of incontestable fact.

The Pasteur Controversy.—Without relating in detail the controversy that Pasteur's announcement made in 1857 that fermentation and putrefaction were brought about by specific ferments and that these were composed of living cells, it is sufficient to state that this assertion led the way for further investigation, discovery and proof, with the result that the microörganisms causing the diseases of relapsing fever, discovered by Obermeier; that of typhoid fever, by Eberth; of diphtheria, by Loeffler; of cholera and tuberculosis, by Koch; of pneumonia, by Friedlander and Frankel, and the origin of many other diseases are now known as the result of the labors of other investigators, whose claims were subjected to the test of the laws formulated by Koch before their character was established as proven.

Germ Laws.—In substance these laws insist (*a*), "that in order to the acceptance that a specific micro-organism is productive of disease, it must be demonstrated. (*b*) That it is constantly present in the fluids or tissues of the individual subject to that disease. (*c*) Its absence from all other diseases. (*d*) Its isolation, growth and repeated cultivation on proper culture media. (*e*) Its power of reproducing the disease after inoculation in susceptible animals."

Results of Germs in the Body.—The results of the introduction of living organisms into the system are local or general; the local disturbances are of an inflammatory nature caused by mechanical irritations arising from the presence or activities of the organisms and are accompanied by proliferation of cells and the formation of new tissue.

General Disturbances.—The general disturbances may possibly result from (*a*) nutritive derangement; or, (*b*) the organisms may cause innumerable foci of local inflammation, producing general disturbance, as for example in tuberculosis; or, (*c*) by their activities of growth, reproduction, nutrition, etc., they may give rise to poisonous materials (ptomaines, toxalbumins, etc.), which act on the system as any general poison, malaria is probably an example of this class.

Period of Germ Ripening.—The period of incubation is the time between the introduction of the specific organism of a disease (exposure to small-pox for example), and the manifestation of its symptoms.

Increase of Symptoms.—The gradual increment of the symptoms is attributed to the progressive growth of the millions of minute fungoid plants, whose period of greatest luxuriance marks the acme of the attack, and the death and destruction of which correspond to the decline of the disease. The contagiousness of the communicable maladies is accounted for very beautifully by the existence of the immense number of bacteria forming the true seeds of disease, constantly produced, evolved from the affected individual, and carried through the air of a room or house either alone or attached to some of the innumerable epithelial cells, which are being rubbed off by millions from the surface of human bodies.

Absence of Second Attacks.—The general absence of second attacks is admirably explained by the hypothesis that the parasitic fungus on the first occasion has exhausted all, or nearly all, of some peculiar (unknown) organic ingredient in the body, which is absolutely requisite for its support, according to the very same law that will cause, as every farmer knows, his wheat to fail if he plants it repeatedly in the same ground and neglects to secure a due rotation of crops.

Transmission of Disease.—Hence, according to this doctrine, contagious diseases are conveyed from one person to another by the transplanting of microscopically visible organisms and spores or seeds which have a separate vitality of their own, each after its kind, and which are to be escaped just as one would escape hordes of animal or swarms of insect pests by shutting them out or killing them before they can succeed in fastening upon human bodies.

The Itch Germ.—It is curious how we have seen in regard to small-

BACTERIA (See Adjoining Plate).

Bacteria (Greek, stick.)—Bacteria are the diminutive organisms commonly called Microbes (Greek, little). They are visible only under a microscope of high magnifying power.

Forms.—There are three recognized forms of bacteria.

Spiralus.—1. The spiral, or wriggling, form, the only form capable of progressive motion.

Bacillus.—2. The stick-like, or straight rod-like form, incapable of motion.

Coccus (berry).—3. Very like, when magnified, a period in print; incapable of motion.

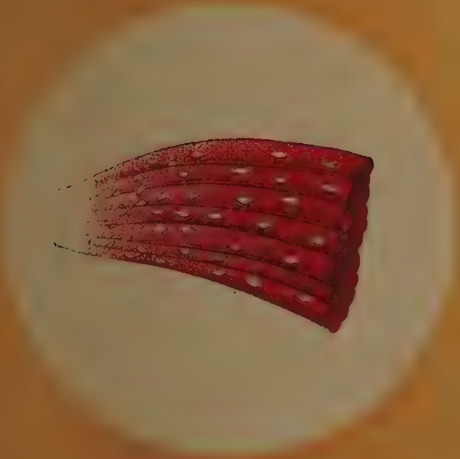
The Plate.—Upper left-hand object. The circle shows the size of the little drop of liquid subjected to the microscope. It is called the microscopic field. Within, in red, is a magnified section of human muscle. In its folds are seen, in white, the encysted spyrala, called trichinæ (hairs). They are found in diseased pork, and enter man through the eating of raw or under-cooked pork. Thorough cooking kills them.

The Plate.—Upper right-hand object. This is the trichina magnified, and more mature. It has taken on the spiral form, due to growth, and is consuming the muscle in which it is embedded. It may, in the end, become the much-dreaded tape-worm.

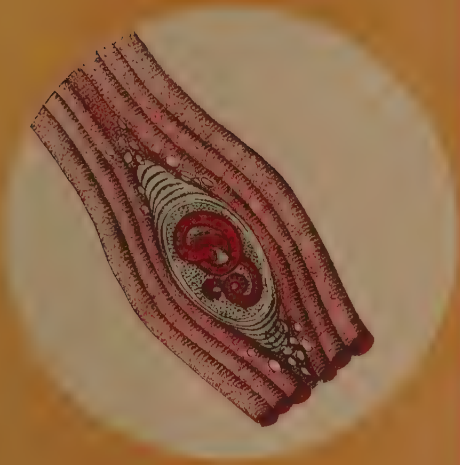
The Plate.—Lower left-hand object. This shows (1) in white, four cells scraped off the intestines, in which cholera germs may lodge. The little dark objects are the spiralla of cholera. They are found in the intestinal canal and feces of cholera patients.

Form.—They are short, comma-like elements, also in the form of U and S, and again long and spiral. They are capable of motion. They are cultivated in gelatin, agar-agar, blood serum, potato and bouillon.

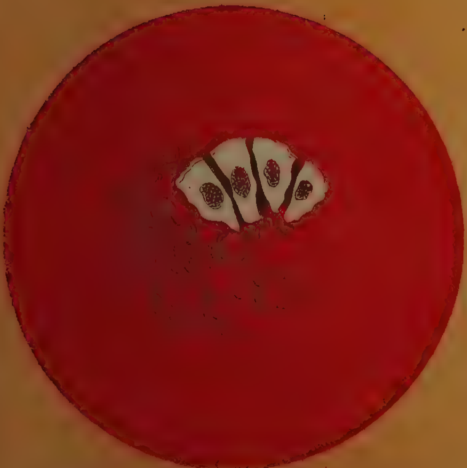
The Plate.—Lower right-hand object. This shows the bacillus of consumption (tuberculosis). It is rod-like in shape, slightly curved, and rounded at both ends. It is not mobile. It may be cultivated in blood serum, glycerine and agar-agar.



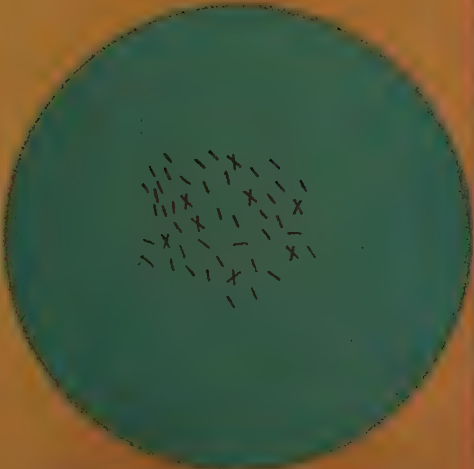
Encysted Trichina in Human Muscle
Double natural size.



Trichina in Human Muscle
Highly magnified.



The Cholera Germ and four Intestinal Cells
(Comma Bacillus)
Magnified to 400 Diameters.



The Fungoid Growth causing Consumption
(Bacillus Tuberculosis)
Magnified to 800 Diameters.

yellow-fever bacteria, relapsing-fever spirilla, and so forth, has not already been raised. Each individual affected with small-pox, scarlet fever, diphtheria, or any other of the diseases above mentioned, is, according to this theory, to be looked upon as a sort of hot-bed or forcing-house for the seeds or sports of that malady.

Germs Grow Like Weeds.—Now, these germs, just like the seeds of larger noxious weeds, which, when allowed to gain a foothold in fields and gardens, propagate themselves with such immense rapidity, yet with few exceptions, have no power to move of their own accord, and can only develop if they meet with air, moisture, and congenial soil suited to their peculiar requirements—that is, if a small-pox patient is shut up in an air-tight room, so that the seeds cannot escape; or if, whilst in the open air, that air is stagnant, so that no seeds are wafted away from the immediate neighborhod of the individual; or if, when carried along by the wind, they are blown away from any human habitations, or are desiccated in a dry atmosphere, baked by the sun's rays or artificial heat, frozen by extreme sold (as seems to be the case with yellow-fever germs); or, finally, if they happen to meet with no persons but those who have had small-pox or been sufficiently vaccinated; in other words, if they do not "fall upon good ground," all this wealth of provision by which nature tries so hard to secure the perpetuation of the poisonous plant causing small-pox in our systems, becomes unavailing, and her malevolent design against our race, carried out with such a prodigality of murderous weapons, utterly fails.

Avoidance of Germs.—The germ-theory of disease teaches that every new case of the contagious maladies is the immediate offspring of a preceding case, and the direct result of exposure of an unprotected human being to the chance of having the spores or seeds of disease implanted in its system, an exposure which it only required sufficient knowledge, sufficient foresight, and sufficient care to avoid.

Book IV.

CURATIVE MEDICINE.

INTRODUCTORY.

PART I.

THE ERUPTIVE DISEASES.

The Plan and Scope of the Subject.—In this part of the work, the author proposes to give an outline of the natural history of each disease, advice as to the modes of preventing its onset when threatened, recommendations as to its hygienic management, hints as to its probable course, fatality, and ultimate results upon the system, if recovery takes place, and finally suggestions in regard to its medical treatment.

Home Value of the Book.—As already advised, the most skillful physician who can be procured should be called in to treat disease; but in the emergency, until he arrives, much can be done in accordance with the directions here given to allay the sufferings of the patient, to place him in a more favorable position for speedy recovery, and, above all, to prevent the calamity which has befallen him from becoming aggravated before the doctor comes, through want of proper care.

Manner of Treatment.—Since a large proportion of the "ills which flesh is heir to" are rarely seen in this country, and have therefore but little importance to inhabitants of the United States, except as matters of curiosity, it is proposed to give very brief notices of these infrequent maladies, in order to economize space for a fuller account of those prevalent diseases which, sometimes in their lives, will, alas, personally interest a majority of the readers of this book.

THE CLASSIFICATION OF DISEASE.

Among the almost innumerable methods of classifying diseases which afflict the human family, one of the latest, and probably the best, is that devised by the Royal College of Physicians of England, and adopted by law as the basis for all those statistical reports relating to medical subjects of which the British nation is justly entitled to be proud. This, with some unimportant variations, is the system adhered to in the present section.

English Names for Diseases.—The plan of this nomenclature is to give an English name to the disease, employing the terms in popular use whenever they are not absolutely inaccurate, and to use only one word, or as few words as possible, in naming a disease. Definitions are attached to the English names in certain instances only, that is in cases where there might otherwise be some ambiguity in the signification of the title. The classification of diseases thus designated is based on their anatomical seat in the human body, the division being first into general diseases and local diseases.

General Diseases.—The general diseases are those which affect the whole frame, and are subdivided into two sections. The first comprehends those disorders which appear to involve a morbid state of the blood, and for the most part present the following characteristics. They run a definite course, are attended with fever, and frequently with eruptions on the skin; are more or less readily communicable from person to person, and possess the singular and important property of generally protecting those who suffer with them from a second attack; they are apt to occur as epidemics. Small-pox is a good example of this group, and in our ceaseless combat with disease it is with disorders of this section that hygiene and preventive medicine have won their grandest triumphs and accomplished their most beneficent work.

Constitutional Diseases.—The next of the general diseases comprises for the most part maladies which are apt to invade different parts of the same body, simultaneously or in succession. These disorders are sometimes spoken of as constitutional diseases, and they often manifest a tendency to transmission by inheritance. Gout and rheumatism furnish good illustrations of this type of disease.

Diseases of the Organs.—The second class, that of local diseases, comprehends all those which affect the structure of special organs, or particular parts of the human body, leading to marked disturbance of their functions. Diseases of the eye, such as cataract, and local inflammations, such as pneumonia or inflammation of the lungs, exemplify the characters of this group. Owing to the wonderfully close association and sympathy between all the different parts of the human frame, no one organ can suffer alone, and hence with the local diseases constitutional disturbances, such as fever, generally arise, and may totally mislead an inexperienced observer.

Recognition of Local Diseases.—The recognition of local disease in obscure cases is often, indeed, one of the most difficult problems a physician can be called upon to solve. Commonly complaint of pain in some particular part directs attention to that spot as the seat of primary disturbance, and leads to its thorough examination, which should be made with the aid of all the mechanical appliances, such as the stethoscope, the microscope, the thermometer, and so forth, which medical science has placed at our disposal. It is only when after all these means are exhausted, in a vain effort to detect local disease at the seat of pain or of pronounced discomfort, sufficient to account for that disturbance, that we are justified in considering local distress as a mere symptom of general disease.

Complicated Diseases.—Unfortunately, neither a general nor a local disease gives the sufferer any positive security against the onset of another malady at the same time, and we often see people burdened with a complication of disorders, each of which by its symptoms obscures the rest, and perhaps renders the proper treatment for them inadmissible. It is this tendency to the development of complications, either secondary to the chief disease or entirely independent of it, which in many affections is the indirect cause of death.

Damaged Organs.—Frequently, too, after a severe illness, some important organ is damaged in its structure, and the patient for the rest of his life suffers for want of its proper performance of function throughout his whole organism, which is really as much crippled in its work as a man would be if his leg or arm had been left upon a battle-field. This is especially the case with the heart after an attack of inflammatory rheumatism, which, by affecting the cardiac valves, prevents the circulation of the blood from being duly carried on, and, as it grows worse in later years, is apt to terminate existence abruptly by sudden death, or by the painful method of prolonged and lingering illness.

Care in Dosing.—The greatest care must be exercised in portioning out the doses of medicines suggested for the treatment of the diseases described, and it should always be recollected that a mistake which is a mere blunder in other vocations may at any moment become a crime in the occupations of prescribing, preparing, or administering medicines. Hence the doctor, the apothecary, and the nurse, who have always the life of the patient in their keeping, should be persons who are willing and able to fully realize their responsibility; those who, whilst on duty, are unceasingly and vigilantly on guard against committing an error of any kind.

Doses Are Always for Adults.—The doses of medicines recommended in this section of the work are always for adults, unless otherwise expressly stated, and must be proportionately reduced for children according to age. Thus, for a young person of from fourteen to sixteen years, two-thirds of the ordinary dose should be given; from ten to thirteen, about one-half; from eight to ten, two-fifths; from six to eight, one third; for a child of four or five years, one-fourth; for one of three years, one-fifth; for one of two years, one-seventh; for an infant of one year, one-thirteenth; and for a baby of from three to six months, one twenty-fourth.

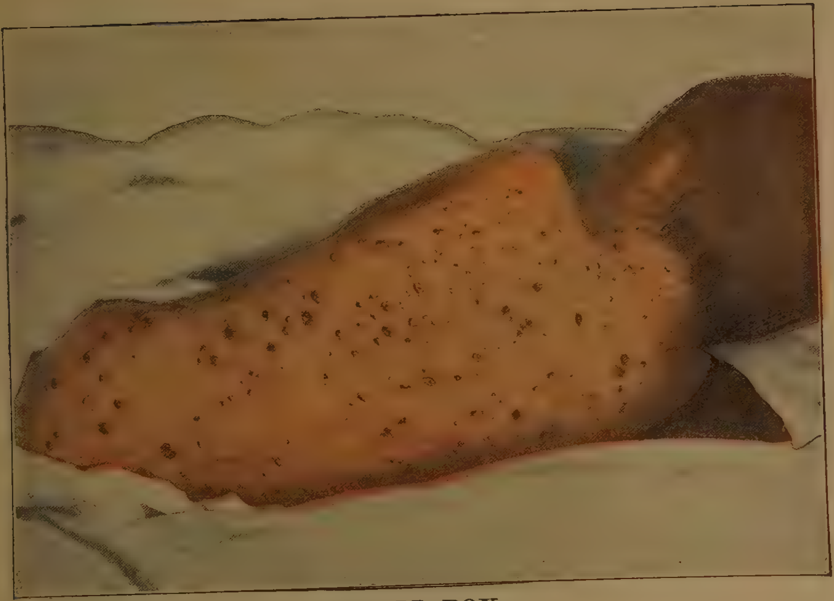
Doses for Children.—For example, the average dose of bromide of potassium for a grown person being twenty grains, that for a youth between fourteen and sixteen years would be sixteen grains; between ten and thirteen, ten grains; between eight and ten, eight grains; between six and eight, seven grains; between four and five, five grains; at three years, four grains; at two years, three grains; at one year, a grain and a half; and at six months, three-quarters of a grain.

How to Graduate Doses.—These fractional amounts are most conveniently arranged for young children by diluting a single dose for an adult with the requisite number of teaspoonfuls of pure water. That is to say, using the above illustration, if it is desired to administer bromide of potassium to a child one year old threatened with convulsions, twenty grains of the drug might be dissolved in thirteen teaspoonfuls of water, and a teaspoonful given every hour or two.

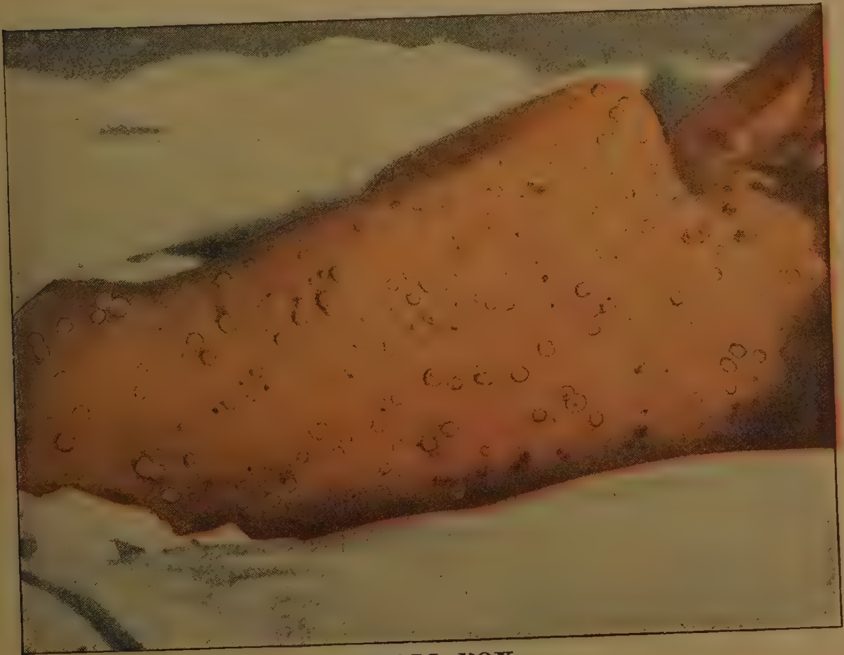
Why Doses Should Vary.—The doses of medicines vary, as already pointed out in the earlier part of this volume, in accordance with sex, idiosyncrasy and habit, and one of the most important advantages enjoyed by a skilled family physician is his power, gained by long practical experience, of so adapting each dose of medicine to every individual of a family, as to gain the greatest amount of benefit with the least amount of injury in any particular case.

Opiates and Emetics.—The general rule given above in regard to doses of medicines to children has some exceptions, the most important being in regard to opium, which is not well borne in childhood, and calomel or castor-oil, of which a larger proportionate quantity may be administered. In regard to the frequency of repetition of medicines, it should be understood that when not otherwise stated, this may be judged of by the effect produced. Thus, as a rule, an emetic may be repeated in fifteen minutes if the patient does not vomit; an opiate may be repeated in an hour if pain still continues without mitigation, and a cathartic in from six to eight hours if no purgative action is effected.

Change of Medicines.—In those unfortunate patients who cannot take



SMALL POX.
Discrete or Separate Form.



SMALL POX.
Confluent or Enmassed Form.

laudanum, morphia, or paregoric for the relief of pain, which constitutes the great symptom of disease, codeia, chloral, hyoscyamus, bromide of potassium, Indian hemp, and lactucarium may be used as substitutes, but without much expectation that they will fully serve the purpose of opium, that greatest boon to suffering humanity.

THE ERUPTIVE AND ACUTE INFECTIONS.

SMALL-POX OR VARIOLA.

Definition.—An acute and highly contagious disease characterized (*a*) by an eruption, which by the third day is papular, by the sixth day is vesicular and by the ninth it becomes pustular (*b*) by a fever which appears with the onset, disappears with the eruption, but returns again when the eruption becomes pustular.

History.—Small-pox was first accurately described by Rhazes, an Arabian physician, in the ninth century, and distinguished by him from measles, but it is believed to be the same as the *pesta magna* described by Galen (A. D. 130-200). It is known to have prevailed during the sixth century and again about the time of the Crusades. The disease is believed to have been introduced into America by the Spaniards early in the sixteenth century.

Cause.—Small-pox is one of the most virulent of the contagious diseases, the poison of which is extremely tenacious of life; it may remain latent in clothes for a long time, and then be capable of exciting the disease. The contagion exists in the secretions and excretions, and in the exhalations from the lungs and skin. The dried scales constitute by far the most important element, becoming attached to clothing and furniture; and are conveyed by persons who have been in contact with the sick. The disease is probably contagious from a very early stage, though it has not yet been determined whether the contagion is active before the eruption develops. The degree of mildness or severity of a case does not influence that of another caused by it, the severest cases being at times followed by the mildest forms, and *vice versa*.

Age.—Unless protected by vaccination or a previous attack, nearly every one is susceptible, from the aged to the child in the womb. The disease is usually fatal in the very young.

Sex.—Male and female are equally affected.

Race.—The North American Indian and the negro are particularly susceptible to it.

Nature of the Disease.—The eruption consists in an infiltration of cells into the *rete mucosum* or into the true skin. Genuine pock marks are frequently found in the mouth, esophagus and larynx and there are parenchymatous or soft cellular tissue degenerations in other organs.

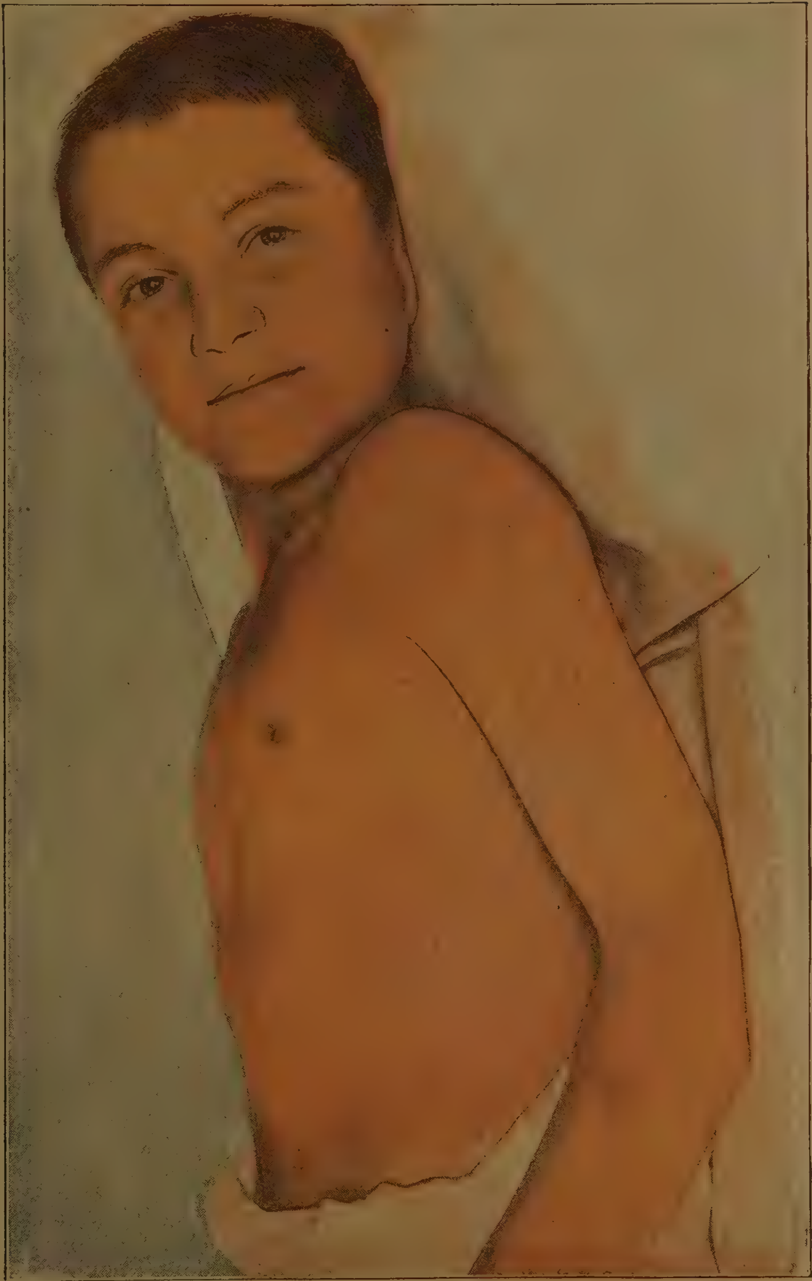
Varieties.—Discrete, confluent, malignant and varioloid.

Symptoms.—1st. Discrete form: After a period of incubation of from nine to fifteen days (Osler), seven to twelve days (Tyson), the disease is ushered in with a chill in adults, and with a convulsion in children. There is an intense frontal headache and agonizing lumbar pains, and vomiting. The pains in the limbs and back are more severe in the initial stage of this than of any other eruptive fever, and connected with the frontal headache and vomiting are specially and decisively characteristic, or pathognomonic, of this disease.

Fever sets in rapidly and may go as high as 103 or 104 the first day; the pulse is rapid, hard and strong at this stage. Delirium may be present, and is at times violent. The face is flushed and the eyes are bright and clear.

The Eruption.—About the third or fourth day small red spots are noticed, first on the forehead and wrists, from which it rapidly spreads over the face and extremities. At this stage the eruption is not unlike measles, but in another twenty-four hours it is quite different, the papules having a "shot like feeling," from which stage they pass into the other two stages mentioned in the definition. As the eruption comes out the fever falls, symptoms abate and the patient feels more comfortable. On the fifth or sixth days the papules become converted in the vesicles, which contains a clear fluid, the vesicle itself having a depressed or umbilicated centre. By the eighth or ninth day the vesicles are converted into pustules, the umbilication disappears and the fluid becomes a grayish yellow, owing to the contained pus. At this stage the fever rises and the general symptoms return. In the discrete form the fever does not usually remain high for more than twenty-four or twenty-six hours, so that on the tenth or eleventh day the fever disappears and convalescence sets in. By the fourteenth day the pustules become dry, are converted into crusts and drop off, leaving, in mild cases, a simple discoloration which in time disappears, but in severe cases a more or less deep ulcer, or, if cicatrization be complete, a simple pit.

Symptoms of the Confluent Form.—2d. This form has the same initial symptoms as the discrete, but they are of greater severity. The eruption in this variety comes out earlier than in the above-mentioned form. Sydenham early called attention to the fact that the earlier the eruption



VARIOLOID.
Modified Small Pox.

appeared the more danger there was in its assuming the confluent variety. In this variety the fever does not abate on the appearance of the eruption as it does in the discrete form. The face, hands and feet present an almost continuous pustule, which often bursts in places, and, the pus partly drying, there results a picture which is horrible in the extreme. True pocks nearly always develop in the air passages, and give rise to a copious fetid discharge from the nose and throat. Should the patient recover it is only after a tedious convalescence, with great facial disfigurement and often with defective vision and hearing.

Malignant Form.—3d. In some cases this form of the disease is ushered in with a high fever, excruciating pains in the back and vomiting. The hemorrhagic rash appears early, while the hemorrhage takes place from the mucous membrane or surfaces, generally on the evening of the second or third day, and the patient may die in from two to six days, sometimes even before the eruption makes its appearance. The face is swollen and large conjunctival hemorrhages, with the deeply sunken corneæ, give a gastly appearance to the features. The mind generally remains clear, but death is the usual result.

Varioloid.—4th. This is small-pox which is modified by a previous attack, or by vaccination. The attack may come on with the symptoms as severe as in the discrete form, but usually the initial fever is less, the eruption is less general and may abort in its early development, the secondary fever is less marked and convalescence sets in earlier. Vesication, or blistering, takes place rapidly, as there is rarely any scarring.

Diagnosis.—The diagnosis or recognition of small-pox is of great importance, and many an anxious hour is often passed by the physician, the patient, and the friends of the latter before it is possible to decide with certainty as to the nature of the disease. While small-pox may be mistaken for a number of affections, the chief difficulty after the eruption begins to come out is in distinguishing it from measles and from chicken-pox. Of course, it is very important to make the diagnosis at the earliest possible moment, in order that timely precautions against the spreading of the disorder shall be instituted. After the pimples begin to contain fluid, the danger of mistaking the malady for measles is over, because the general eruption of measles is never vesicular, although a few little blisters are occasionally seen in bad cases.

To Distinguish from Measles.—In many instances a probable opinion can be given that a disease is measles and not small-pox, from the fact that the eruption of pimples is softer, less shot-like, and arranged in obscurely-defined crescents upon the arms and neck. In others, however, it is impossible to decide before the second day of the eruption, when, as a rule, some few of the pimples will be found slightly vesicular if the disease is small-pox.

To Distinguish from Chicken-Pox.—When the vesicles appear, the great point of distinction between them and the vesicles of chicken-pox is that the small-pox vesicle is depressed in the middle, giving it what is called the umbilicated or navel-like aspect. This is an important characteristic, and should always be carefully looked for. Before the eruption comes out, only a probable guess can be made in many instances.

Unusual Symptoms.—Dr. Flint, perhaps the most acute diagnostician in America, says that decided fever following immediately after a chill, the fever continuing without much remission for two days, pain in the back being a prominent symptom, if it be known that the patient has been exposed to small-pox, or if this disease is prevalent, renders the diagnosis extremely probable. In comparatively rare cases, unusual symptoms in an attack of small-pox might for a day or two render the diagnosis difficult from scarlet fever, the simple mild fever called febricula, the skin disease called lichen, some of the pustular eruptions of the venereal disease, and in its very earliest stage from erysipelas and typhoid fever.

Treatment.—Since we have as yet discovered no antidote for the small-pox poison, the chief treatment is the relief of symptoms, as far as possible, as they arise, and careful nursing, in order to avoid needless aggravation of the disease or the development of complications. The mildest cases, as well as those which are more severe, should be kept in bed in a cool apartment, which is ventilated as freely as possible, without producing dangerous draughts.

The Back.—In bad cases the patient's back ought to be frequently examined, and suitable precautions taken against the formation of bedsores, as recommended under the head of typhoid fever, and the hair cut off close, in order to avoid the matting with the corruption from the pustules when that begins to discharge.

The Bowels.—The bowels should be well opened as soon as fever develops with a tablespoonful of castor-oil, or a saline purgative, such as a Seidlitz powder or a bottle of citrate of magnesia, and then a cooling and diaphoretic mixture, composed of half a teaspoonful of sweet spirits of nitre, ten grains of bromide of potassium, and five drops of laudanum, or the one thirty-second of a grain of morphia, administered every two or three hours if there is much pain or restlessness. After the primary fever subsides, with the coming out of the eruption, there are often a few days during which no medical treatment is necessary; but with the appearance of the secondary fever, the cooling mixture should be resumed, or ten grains of Dover's powder may be given at bedtime, and repeated in two hours if the patient is very wakeful or there is much delirium.

The Itching.—To relieve the itching, which is sometimes almost intolerable, the surface of the skin may be sponged over with a weak solution of sulphurous acid or of carbolic acid, six or eight drops to the ounce of water. If no relief is obtained from these, anointing the body with cosmoline, or with simple ointment, may be tried; but it is sometimes needful to muffle the hands, especially of children, in order to prevent them from scratching open the pocks after they begin to heal, and so rendering the resulting scars much deeper and more permanent. Keep the patient in a dark room and cover the face with a mask of mercurial or charcoal plaster, so as to shut it from the light; this diminishes the danger of being pock-marked.

The Fever.—The fever, when high, must be kept within limits, either by cold sponging or by the cold bath, the water being at a temperature of 75 degrees when patient is first put in and then gradually lower it to 68 degrees. During convalescence bathing should be frequent, as it helps to soften the crusts. In malignant small-pox, which generally proves fatal, where very soon the face becomes so swollen that the eye-lids are tightly closed and glued together, they should be frequently bathed with a saturated solution of boric acid. The mouth and nose should be kept clean and soft by frequent injections. The patient should have plenty of cold water. Should the heart become weak hypodermics of stychnine, one-thirtieth of a grain, or dram doses of aromatic spirits of ammonia by the mouth.

Treatment of Malignant Small-Pox.—In malignant small-pox, and in the petechial or hemorrhagic form, the black small-pox of common language, the only chance of successful treatment is to support the strength with quinine in four-grain doses thrice daily, or Peruvain bark and other tonics, and with stimulants such as wine or brandy or milk-punch, in the forlorn hope that unusual vigor of the constitution may thus be reinforced long enough for the violence of the disease to become expended. If the patient can thus be kept alive until after the twelfth or fifteenth day without any important organ becoming seriously damaged in its structure, the chance of recovery will subsequently increase every day. The disease being self-limited, it is obviously our chief duty, in the absence of any known specific, to direct all our energies toward sustaining the patient's strength in his battle with the disorder, and the prospect of recovery, or prognosis, as it is termed, turns upon the relative power of endurance of the disease-poison and the patient's constitution.

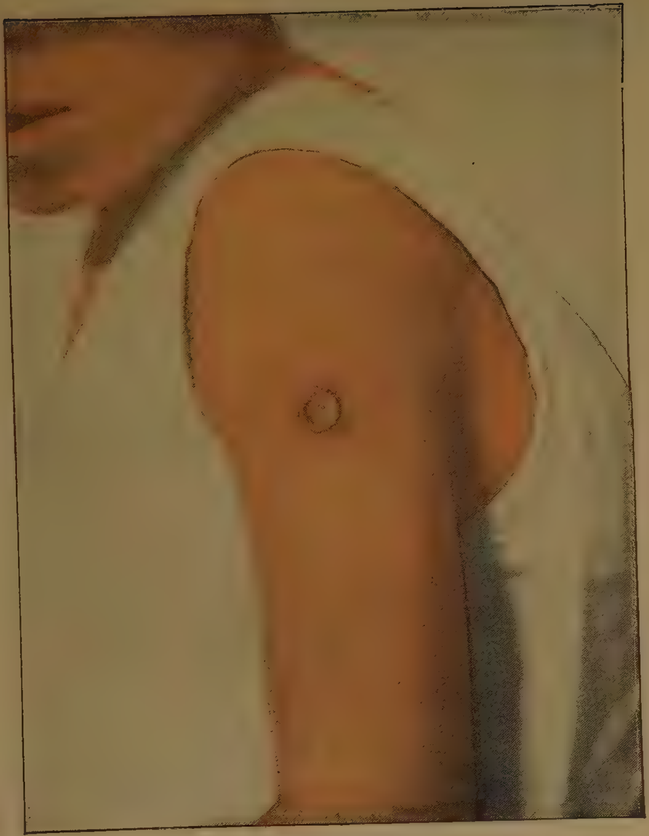
Diet.—The diet in the early stage of small-pox, like that in most febrile conditions, should be light and unstimulating, consisting of rice, cornstarch, bread and milk, or arrow-root. Oranges or lemonade in moderation may be allowed, unless there is a tendency to diarrhœa. Ice water, lumps of ice, or iced carbonic acid water may be given *ad libilum.* Later on in the disorder, when the strength begins to fail and the pulse grows weaker, strong animal broths, beef essence, and other highly nutritious aliments are necessary; and if the pulse at the wrist should seem very feeble, and especially if it should become intermittent, milk-punch, egg-nogg, or other powerful stimulants ought to be resorted to.

Nursing in Small-Pox.—The general care of a small-pox patient ought to be afforded in accordance with directions contained in the chapter on Nursing, and most of the special precautions for avoiding the extension of the disease, and so forth, have been pointed out in the article on Contagious Influence. On account of the danger of pneumonia and pleurisy, particular watchfulness is needed against taking cold from draughts of air, and during the delirium of the fourth stage, in bad cases, the attendant must be constantly on guard to prevent the patient from injuring himself or others. The nurse should wear an overall and remove it on coming out of the room, and her head should be covered with a cap.

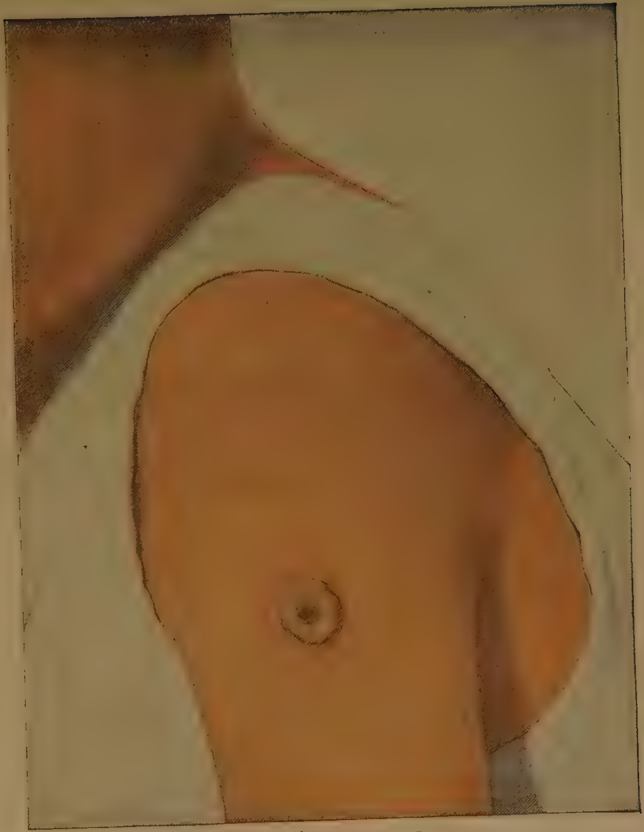
VACCINATION THE GREAT PREVENTIVE OF SMALL-POX.

Seeing, then, that small-pox is a most painful, loathsome, and fatal disease, for which we have no cure, it becomes infinitely important to avail ourselves of the protection against its ravages afforded by Dr. Jenner's beneficent discovery of vaccination, a discovery which ought to make his name honorable whilst the world stands.

And yet, strange to say, there are people bearing the general aspect of reasoning beings who oppose vaccination; and in England, where vaccination has been made compulsory by law, a league has been formed to combat its enforcement. Recently the folly of these fanatics met, it is stated, with a most righteous punishment in the following circumstance: A leading anti-vaccinationist, Escott by name, who refused to have any of his children vaccinated, lately lost two of them and his wife by small-pox. Escott borrowed a suit of clothes from a friend to attend his wife's funeral, and returned them without disinfection, with the result that the lender caught small-pox and also died of it. Subsequently nearly every



VACCINATION.
Inflamed Condition.



VACCINATION.
Perfect Mark.

house in the neighborhood was infected, producing a local epidemic of small-pox, during which sixteen patients were removed to the pest-house. The only excuse for the obstinacy of such deluded people is, that more than half a century of deliverance from the horrors of small-pox has rendered most persons practically ignorant of its dangers. In the latter half of the eighteenth century, that is, from 1750 to 1800, small-pox attacked almost every inhabitant of England, and about one out of every five seized with it died, whilst nearly another fifth of its victims were disfigured or crippled for life. It is estimated that two-thirds of the blind people in England at that time lost their sight from small-pox. To give an idea of its relative mortality, Dr. Guy states that it caused eighteen per cent. of all the deaths, and was one hundred times as fatal as diarrhœa, with its allied intestinal disorders, and six times as fatal as apoplexy, palsy and sudden death taken together.

Objections to Vaccination.—These, aside from the mere sentimental ones are that in some instances erysipelas and venereal disease have been apparently caused by it, and that it has been accused of being the means of inoculating the human system with scrofula, consumption and certain cutaneous affections. Now, all of these objections can be removed by the use of what is called bovine virus, obtained direct from the cow, without ever having passed through any human body. Glycerinized lymph is now conceded to be the better vaccine virus.

Duty of Vaccination.—This is rendered far more imperative by the danger which every unprotected person in a community exposes his neighbors to by becoming the starting-point of an epidemic of small-pox. Hence, although a man may have the privilege of thus trifling with his own life and health, he has no right to imperil others by his perversity or ignorance; and the good of society, which is a higher law than that of personal liberty, demands that compulsory vaccination be legally established, as it is hoped it will be ere many years elapse.

Making Sure of Immunity.—Even after exposure the individual should be vaccinated, for though it may not prevent small-pox, it will certainly moderate the severity of the attack. The writer has had a case of this kind to come under his personal observation.

COW-POX OR THE VACCINE-DISEASE.

How Produced.—This disease, called Vaccina in medical books, is induced in the human being by the process of vaccination, either accidentally, as in the case of the young milkmaid who led Dr. Jenner to his grand discovery, or, as is usual nowadays, by being rubbed into a slight wound made for the purpose. It is apparently a modified form of small-pox, in which a cow-pox vesicle on the udder of a cow or heifer is the common original source of the infecting matter.

Character.—The disease is attended, as a rule, with no further eruption than the vesicle, ripening into a pustule at the point or points where the matter is inoculated. It is communicable by inoculation, but not by the other ordinary modes of infection, mild in its course, and yet, generally speaking, protective against small-pox.

Operation of Vaccination.—This is by no means so simple and unimportant as it seems at first sight, and it therefore ought always to be performed by a physician. It is better not to cut so deep in vaccinating as to cause much of a flow of blood, lest this fluid should wash the virus out of the incisions. The usual place for vaccinating is on the outside of the arm, an inch or two below the shoulder; but if the operation fails here, as is sometimes the case after repeated trials, an attempt may be made on the calf of the leg, just below the knee.

When to Vaccinate.—Vaccination should be performed on all children between the ages of one and three months, unless some special reason exists for its postponement, and it is recommended to insert the virus in four or five places close together, so as to produce several pustules, although, by a majority of physicians in this country, one pock is thought sufficient.

Revaccination.—Revaccination should be performed about once in seven years, as in some instances the protection afforded appears to wear out in that time; and, as there is no means of recognizing them, the safer way is to renew the vaccination.

The Virus.—The animal or bovine virus is supplied from carefully vaccinated calves by a number of producers in various parts of the country. It is usually furnished on little ivory points, shaped like a lancet-blade, or on pieces of quills. Either of these is to be moistened in pure water, and then rubbed on a lightly scarified surface, prepared as already described. The bovine virus is apt to make a very sore arm, but has the great advantage of avoiding all possibility of introducing the horrible poison of venereal disease into the blood of the infant operated upon.

VARICELLA OR CHICKEN-POX.

For full description and treatment of this disease, peculiar to children, see CHILDREN'S DISEASES, Book IV, Part XII.

MEASLES OR RUBEOLA OR MORBILLI.

For full description and treatment of measles, see Book IV, Part XII, Diseases of Children.

RUBELLA, RÖTHELN OR GERMAN MEASLES.

Definition.—An acute infectious disease resembling both scarlet fever and measles, but differing from these in its short course, slight fever and freedom from complications.

Cause.—It is propagated by contagion and spreads with great rapidity.

Incubation.—About two weeks.

Symptoms.—This is a mild contagious affection, very similar in many respects to ordinary measles, but apparently differing from it, because neither disease affords any protection from the other. The color of the eruption is rather more a rose-tint than in ordinary measles, the pimples are round instead of oval, and the crescentic arrangement is wanting or extremely obscure. Children are chiefly affected with German measles, although it also occurs after adult age is attained, but in any case the malady is so slight that the patients rarely feel sick enough to keep in bed, and no instances of death from the uncomplicated affection are recorded.

Treatment.—The treatment, diet and nursing appropriate to German measles are the same as those recommended in the ordinary form, in the few cases where any special care is needed.

SCARLET FEVER OR SCARLATINA.

For description and treatment of scarlet fever, see Diseases of Children, Book IV, Part XII.

BREAK-BONE FEVER OR DENGUE.

Synonyms.—Dandy, or break-bone fever.

Definition.—An acute and infectious disease characterized by febrile paroxysms; pain in the muscles and joints and sometimes by an eruption on the skin.

History and Geographical Distribution.—The disease was first recognized in 1779 in Cairo and in Java. The description by Benjamin Rush of the epidemic in Philadelphia in 1780, is one of the first and one of the very best articles ever written on the disease. S. H. Dickson gives a graphic description of the disease as it appeared in Charleston in 1828. Since that date there have been five or six widespread epidemics in tropical countries, the last occurring along the Gulf States in the summer of 1897, where for some time it was supposed to be yellow fever. None of the recent epidemics have extended to the Northern States, but in 1888 it prevailed as far north as Virginia.

Cause.—The rapidity of diffusion and the pandemic character are the two most important features of dengue. There is no disease, not even influenza, which attacks so large a proportion of the population. A micrococcus has been found in the blood of patients by McLaughlin, of Texas.

Symptoms.—**Incubation**—Three to five days, during which the patient feels well. Persons who catch this curious complaint are often attacked with it very suddenly, frequently in the night after retiring in their usual health. The temperature rises in a few hours to 103 degrees and in one or two days may reach 106 or 107 degrees, the skin becomes dry and hot, and the countenance indicates utter helplessness and prostration; with this febrile condition, there is usually pain in the head, back, limbs and small joints, which latter swell up as in rheumatism. The pulse is rapid; loss of appetite, coated tongue, slight nocturnal delirium and concentrated urine. The pain may be so severe that the patient cannot move.

Duration.—The average duration of the first febrile stage is about forty-eight hours, although it may vary from twelve hours to three days, after which the symptoms begin to subside and a period of remission of two or three days occurs.

Debility and Eruption.—During this time general debility and muscular pains predominate, and fever is usually absent, but on the fourth day it reappears, and on the fifth or sixth an exanthematous eruption develops, which is sometimes more like the flush of erysipelas than the papules of either measles or scarlet fever. The color, however, is not so intense, and it spreads over the whole body in forty-eight hours.

Pains and Swelling.—When the eruption reaches its height, painful swellings of the lymphatic glands of the neck, back of the head, armpits and groins occur. With this tumefaction of the glands, the nose, mouth and throat become implicated, swelling up and growing excessively painful. On the seventh or eighth day desquamation commences and the acute stage terminates.

Malady Not Fatal.—The victims of dengue are to be commiserated for the horrible and agonizing pains which they are called upon to suffer, and which are peculiar to the disease; but they may find some comfort in the assurance that the malady is rarely, if ever, fatal.

Recurrence of Pain.—The recurrence of the excruciating pains in the limbs at a time long after the subsidence of the fever must be borne in mind, as influencing any opinion ventured in regard to the probable duration of the illness.

Diagnosis.—The diagnosis of dengue must occasionally be made from rheumatism, measles, scarlet fever and erysipelas; but a complete history of the case can hardly fail to clear up any doubts, particularly if dandy fever is prevailing in the locality as an epidemic.

Remedies.—Since the malady is not a dangerous one, anodynes to relieve the excruciating suffering, especially hypodermic injections of one-eighth or one-sixth of a grain of morphia. During convalescence iodide of potash is recommended for the arthritic pains and tonics are indicated.

TYPHUS FEVER.

Synonyms.—Ship, jail or putrid fever.

Definition.—An acute infectious disease favored by closely crowding human beings together, characterized by sudden onset, a maculated rash, marked nervous symptoms and a termination by crisis about the end of the second week.

Causes.—It is excited by an unknown poison which is capable of being carried in the clothes. It is rare in America, though there were two mild epidemics in the Philadelphia Hospital in 1866 and in 1883; it is not uncommon in England and Ireland. Bad food, impure air and overcrowding are predisposing factors.

Incubation.—Incubation is placed at about twelve days, but may be less, and its duration from ten days to two weeks.

Symptoms.—The fever begins abruptly with severe pain in the head, back and limbs; extreme prostration, and fever which reaches its maximum (104 degrees to 105 degrees) in two or three days. The temperature remains high for about ten days when it falls by crisis (suddenly).

The Eruption.—It is a continued fever, attended with a dark-red or purplish mottled rash over the body, with great nervous prostration, restlessness and delirium, or dullness and stupor, but without any specific affection of the bowels. The eruption, which makes its appearance from the third to the eighth day of the disease, is at first slightly elevated and disappears when pressed upon with the finger; but after the second day from the time it comes out, it is persistent under pressure and continues to show this character until it fades ten or twelve days afterward.

Fatality.—When it proves fatal, as it does in about fifteen per cent.

of the cases, death usually occurs between the twelfth and twentieth days of the attack.

Advent Symptoms.—The advent of the disease is somewhat gradual, beginning with general soreness, discomfort and weariness, with loss of appetite and disturbed sleep. Shivering and a feeling of coldness, especially along the spine, sometimes amounting to an actual chill, not unfrequently mark the commencement and are soon followed by heat of skin, rise in temperature and severe frontal headache. This headache is occasionally very severe and rarely absent at first, but abates about the tenth day.

Disturbed Sleep.—Slumber is disturbed by dreams, is unrefreshing, and when the patient is not asleep there is a constant tendency to heaviness, the mind ceases to think and the attention cannot be concentrated upon any subject. He may lie with his eyes open, evidently not in slumber, yet indifferent or insensible to all which goes on around him.

Bodily Weakness.—This is frequently extreme, and the sufferer often voluntarily takes to his bed on the first day of his illness. This exhaustion and prostration is totally disproportionate to the amount of muscular exertion which has been made. The eyes, when examined, are found to be dull and heavy, the white portion injected or blood-shot and a peculiar dusky flush overspreads the cheek.

The Delirium.—As the days pass debility rapidly increases and delirium comes on the latter part of the first or early in the second week. In persons of nervous, excitable temperament it commences sooner and may appear on the third or fourth night of the fever, showing itself primarily, perhaps, by a little confusion of thought on awaking from a restless doze.

The Tongue.—The tongue is coated at first with a white fur, but after six or eight days often may become dry, swollen and covered with thick, brownish crusts of mucus and cast-off epithelial cells, which make up what is called *sordes.*

The Bowels.—The bowels are, as a rule, constipated, and this should especially be borne in mind, because it forms an important distinguishing mark between this disease and typhoid fever, with which typhus was formerly confounded.

The Pulse.—The pulse is quickened from the outset and in grave cases continues to increase in rapidity until it may more than double its ordinary frequency, beating from one hundred and forty to one hundred and sixty times per minute.

Complications.—Brocho pneumonia is perhaps the most common complication. It may pass on to gangrene; in certain epidemics gangrene of the nose, hands and toes have occurred.

Diagnosis.—The diagnosis of typhus fever requires to be made in this country chiefly from typhoid fever and relapsing fever, but it is sometimes difficult to distinguish it at first from small-pox, plague, erysipelas and cerebro-spinal meningitis.

Treatment.—As the treatment, diet and nursing of typhus fever are similar in most respects to what is required in the far more common disease, typhoid fever, the reader is referred to our article upon the latter affection for further information.

Isolation.—When an epidemic of typhus fever breaks out in a crowded jail, hospital or tenement, the great cause of its prevalence should, of course, at once be abolished, by separating those exposed to it as widely as possible and treating the sick in isolated sheds, huts or even in tents.

TYPHOID FEVER.

Synonyms.—Enteric fever, autumnal fever or typhus albuminalis.

Definition.—An acute infectious disease due to the implantation and proliferation of the bacillus of Eberth, characterized by ulceration of the lymph follicles of the intestines of the mesenteric glands and by an enlargement of the spleen.

Historical.—The disease is easy recognizable in the descriptions of Hippocrates (B. C. 460-357) and Galen (A. D. 130-200). Doubtless John Huxam's "slow, nervous fever," described in his "Essay on Fevers" was the typhoid of the present day, and his "putrid malignant" the yellow fever of to-day. It was, however, the writings and teachings of the great French physician, Louis, which did most to disseminate a knowledge of the true nature of typhoid fever, to which he gave the name it bears. Among some of his pupils were the Americans W. W. Gerhard and C. W. Pennock of Philadelphia and James Jackson, Jr., of Boston. To the former, however, is due the great honor of having first clearly laid down the difference between typhoid and typhus.

Causes.—Typhoid fever prevails in temperate climates in which it constitutes the most continued fever. It is widely distributed throughout all parts of the world.

Seasons.—It prevails most in the autumn months, especially following a dry summer.

Sex.—Males and females are equally liable.

Age.—Typhoid fever is a disease of youth and adult life. The greatest susceptibility is between the ages of fifteen and twenty-five. It is rare after sixty and infants are seldom attacked.

Immunity.—As in other fevers, not all exposed to the infection take the disease. Some writers claim that one attack protects, but others claim that one attack predisposes to another.

THE BACILLI OF TYPHOID.

Bacilli in the Body.—The bacilli are found in the lymphoid tissues of the intestines, in the mesenteric glands, in the spleen, liver, bile and in the bone marrow. They also occur in irregular clumps in the contents of intestines and in the stools; they have also been found in the blood, urine, sweat and sputa.

Bacilli Outside the Body.—The bacilli retain their vitality in water for weeks, but disappear from ordinary water in competition with saprophytes in a few days. In milk they undergo rapid development without changing its appearance. They may increase in the soil and retain their vitality for months. They are not killed by freezing, but, as Pruden has shown, may live in ice for months.

MODES OF CONVEYING BACILLI.

1. **Contagion.**—The possibility of the direct transmission through the air from one person to another must be acknowledged, although, as shown by Germano, when completely dried in air currents, the specific bacillus quickly dies. There are house epidemics in which water and food contamination can almost be excluded. The nurses and attendants who have to do with the stools and body linen of the patient are alone liable to direct infection.

2. **Infection of Water.**—This is unquestionably the most common mode of conveyance. Many epidemics have been shown to have originated in the contamination of a well or a spring.

3. **Milk.**—Milk may be the source of infection, as it may be contaminated in washing out the cans with infected water.

4. **Ice and Salads.**—In addition, the germs may be conveyed in ice, salad, celery, and so forth. A fly which has alighted on the soiled linen of a patient may contaminate the milk or food.

Bad Sewage and Drainage.—Filth, bad sewers or cess-pools cannot in themselves cause typhoid fever, but they furnish the conditions suitable for the preservation of the bacillus.

Symptoms.—Typhoid fever, also called gastro-enteric fever, owing to the circumstance that the stomach and intestines are the chief seats of the disease, is characterized by a faint, scanty eruption of rose-colored spots, appearing chiefly upon the abdomen, from the fourth to the eighth day, and coming out in successive crops. Each crop of spots continues visible for about three days.

Cess-Pool Fever.—On account of its frequent connection with bad drainage, this fever has received the vulgar but expressive name of "drain or cess-pool fever," which, despite its indelicacy, it would be well to perpetuate as a constant warning against that neglect of sanitary arrangements in buildings to which it is chiefly due.

Initial Symptoms.—The onset of this dangerous and fearfully prevalent disease is very often a gradual one. The patient for some days feels weak, languid and depressed, loses his appetite, suffers from headache, and is restless at night. In other cases, however, the malady begins with a slight chill, or a feeling of coldness running up and down the back, and among children the first decided symptom may be an attack of convulsions. Frequently, too, slight bleeding of the nose is noticed, and a little tendency to looseness of the bowels, which may even be aggravated by errors in diet, or other imprudence, into active diarrhœa.

Secondary Symptoms.—After the stage of invasion is completed, the pulse and temperature rise steadily, the former going up to 100 degrees or 110 degrees, and the latter ascending to 104 degrees, or sometimes 105 degrees during the first week. The heat of the body is almost always greater at night than in the morning, and this increment is so regularly advanced during the onset of the disease, that it is quite possible for a skilled physician to recognize typhoid fever by a glance at the record of temperature, or "temperature chart," alone in many instances.

The Diarrhœa.—The diarrhœa rapidly grows more severe, and in bad cases is frequently very profuse, fifteen or twenty thin, watery evacuations occurring in every twenty-four hours. Pain in the abdomen, especially in the region of the right flank, is nearly always complained of, and with the diarrhœa is due to the characteristic ulceration of certain oval spote in the lower portion of the small intestine, which have received the nams of Peyer's patches. Bronchial irritation and cough are common.

Facial Appearance.—The face sometimes wears an anxious, haggard look, but frequently, even early in the disease, it shows the dull, indifferent aspect, so often indicating an oppression of the brain, which will deepen into stupor, then coma and finally death. The flush of the face is apt to have a more dusky, purplish tint than in other fevers, and the skin is more dry and burning, or pungent, from the smaller amount of perspiration.

The Delirium.—In the second week delirium generally comes on, and although occasionally violent and requiring the patient to be controlled by physical force, it is more frequently of a low, muttering character. The tongue becomes dry and brown, and tympanites, or the accumulation of gas in the bowels, is generally considerable, and may cause by its enormous distension great suffering, or even lead directly to a fatal result. Ringing or buzzing in the ears with deafness is very often noticed. In bad cases the diarrhœa is often very profuse, and discharges of fluid blood, perhaps in large quantity, sometimes occur and prove quickly fatal.

The Third Week.—In the third week, if the case is to end unfavorably, the pulse grows frequent and feeble, the tongue is dry, cracked and covered with brown sordes, the delirium and stupor are constant, involuntary discharges from the bowels occur, and the patient may die exhausted, or if the fatal issue comes earlier, before complete prostration of muscular strength, it may be preceded by convulsions.

Signs of Recovery.—If, on the contrary, recovery awaits the patient, the pulse falls off in frequency, the temperature gradually diminishes, the tongue cleans off usually from the edges, appetite slowly returns and the mental powers are little by little regained.

Unfavorable Symptoms.—The unfavorable symptoms, besides those above mentioned, are an unusually high temperature, 106 degrees or over, picking at the bedclothes, slipping down in the bed, and entreaties, often of pitiful earnestness, to be taken home.

Special Features and Symptoms.—1. A severe facial neuralgia may put the practitioner off his guard. In cases when the patient has kept up, "fought the disease," the first manifestation may be a pronounced delirium. In rare cases the disease sets in with the most intense cerebro-spinal symptoms, simulating meningitis.

2. There may be pronounced pulmonary symptoms. In a few cases the disease sets in with a single chill, with pain in the side and all the characteristic features of lobar pneumonia.

3. There may be intense gastro-intestinal irritation. Occasionally there are cases with such intense vomiting and diarrhœa that poisoning may be suspected.

Fever.—The fever has invariably a step-ladder rise; the evening temperature is from one to one and one-half degrees higher than the morning remission.

Fever of Convalescence.—After the temperature has been normal for five or six days the fever may rise suddenly to 102 degrees or 103 degrees, and after persisting from one to three or more days fall to normal. With this condition there is no furring of the tongue and no distention of the abdomen. This condition is by no means uncommon, and is of especial importance, as it is attributed in most cases to errors in diet, constipation, or excitement of any sort, such as seeing friends.

Complications.—1. Thrombosis of the femoral vein, more frequently on the left side, resulting in the "milk leg." It occurs, according to Murchison, in one per cent. of all cases. Embolic abscesses may occur in the kidney and lungs.

2. Albuminuria is present to some extent in all severe cases, commonly as the result of the fever, but sometimes is the direct result of an acute nephritis.

3. Hemorrhages usually occur during the third week, and are indicated by a sudden fall of temperature, followed by dark red or tarry stools.

4. Cardiac complications, including pericarditis, endocarditis and myocarditis, are sometimes present. The latter may be the cause of sudden death.

5. Typhoid fever predisposes the patient to tuberculosis.

6. Peritonitis may result from perforation or from extension by continuity; the former is more common and is recognized by a sudden pain, a fall of temperature, distention of the belly and symptoms of peritonitis.

7. Pneumonia may supervene in the second or third week of a typhoid fever, as a complication, in which the true relation is difficult to determine.

Diagnosis.—The diagnosis of typhoid fever must be made in its early stage from typhus fever, relapsing fever, scarlet fever, measles and smallpox. At a more advanced period it might be confounded with the typhoid condition met with in uremia and pyemia, and also with enteritis or inflammation of the bowels, peritonitis or inflammation of the membrane covering the intestines, meningitis or inflammation of the membranes of the brain, acute bronchitis or pneumonia, and with acute consumption.

The Rose-Colored Spots.—If a patient who has been suffering from headache, prostration, loss of appetite, restlessness and gradually increasing fever, has a slight bleeding at the nose unprovoked by accident, we may strongly suspect typhoid; but until the rose-colored spots appear there is no certainty.

Treatment.—The medical treatment in typhoid fever must be directed toward mitigating suffering, warding off complications and obviating the tendency to death. In the early stages of the complaint headache is one of the most prominent symptoms. All we can hope for is to procure some mitigation of the intense suffering it frequently occasions.

Ice Application.—The application of ice to the head, either in a bladder or India-rubber bag, or, what is still better, by means of an ice-cap, made of numerous coils of thin rubber pipe, through which ice-water is kept flowing, generally diminishes the pain, which, if very intense, may require the application of one or two leeches behind the ears.

For Checking Diarrhœa.—Diarrhœa, if troublesome, is to be checked, but not stopped, by chalk-mixture, bismuth-mixture or astringents with opium, as

Morphine sulphate	1 grain
Creosote	6 drops
Bismuth subnitrate	3 drachms

Mix and make into 12 papers and take one every three hours.

Or, when ordinary measures fail—

Silver nitrate	5 grains
Extract of opium	4 "

Mix and put into pills, making 20. Take one every three hours.

Its use, however, after the first few days, must be continued with great caution, on account of permanently blackening the patient's skin.

Rest.—Absolute rest in bed, with the use of the bed pan, must be enforced.

Rendering Stools Innocuous.—The stools should be rendered innocuous. This may be done by dissolving a pound of the chloride of lime in four gallons of water. Add a quart of this solution to each discharge and allow it to remain in the vessel at least an hour before disposing of it. Soiled bed clothes should be thoroughly boiled.

Restlessness.—In cases where restlessness rather than stupor predominates, ten grains of Dover's powder, or a draught composed of twenty drops of laudanum and ten of antimonial wine, will frequently moderate the excitement in a very favorable manner. When the tongue becomes dry, ten drops of the oil of turpentine given in mucilage every four hours, often have a very happy effect, and its influence upon the healing of the intestinal ulcerations is highly lauded.

Stimulants.—Generally, during the second week, sometimes a few days earlier, and occasionally a few days later, according to the violence of the attack and the patient's strength of constitution, it is advisable to begin with the use of stimulants. The best indication of their becoming needful is a slight failure of the strength of the pulse, but much experience is necessary to judge correctly of the time, the quantity, and the frequency with which alcohol should be administered.

Kinds of Stimulants.—At first half an ounce of good whiskey or brandy, with two or three ounces of milk and half an ounce of lime-water, if nausea persists, may be allowed three times daily, but this amount must generally be increased from day to day, sometimes with great rapidity, until in the worst cases a pint and a half of brandy is swallowed in twenty-four hours. Beef-tea, beef-essence, and some farinaceous food, such as arrow-root or cornstarch, ought also to be urged upon the patient at this time.

To Stop Hemorrhages.—In cases of hemorrhage from the bowels, ten grains of kino, a teaspoonful of syrup of rhatany, or ergotin hypodermically, in full doses, afford the best chance of success; and if perforation of the intestine, in consequence of the eating through of one of the ulcers, takes place, the very slender hope of recovery is increased a little by the administration of large doses of a grain every hour of opium and by securing perfect rest in bed.

Hydrotherapy.—Since many of the worst symptoms of typhoid fever seem to be due to the effect of overheated blood upon the brain; efforts to reduce the temperature by the aid of cool baths of about 70 degrees Fahrenheit six or eight times daily, or cold sponging of the whole body, have of late years taken a very prominent place in the treatment of the disease, and are believed to reduce markedly its rate of mortality. Where, in spite of judicious employment of means to bring down the temperature, unconsciousness continues, great watchfulness is necessary in regard to the evacuation of the bladder, which may become dangerously distended, and even burst for want of attention.

Drawing the Urine.—When examined and found to be over-full, the urine should be at once drawn off by means of a catheter, and the operation repeated twice or thrice every twenty-four hours, until the patient resumes control over his functions.

Other treatment would be the

1. Sponge Bath.—The water should be cold or ice-cold, according to height of fever, and a thorough sponge bath should take from fifteen to twenty minutes. I have added alcohol to the water with good results.

2. Cold Pack.—If tub is not available the patient may be wrapped up in a sheet wrung out of water at 60 degrees to 65 degrees and then cold water sprinkled over him with a watering pot.

3. The Bath.—The tub should be long enough so that the patient can be completely covered, except his head. Every third hour, if temperature is above 102 degrees, the patient is placed in a bath at 70 degrees Fahrenheit, which, after the patient is put in, can be lowered a degree or two. In it he remains for fifteen or twenty minutes. He is then taken out, wrapped up in a dry sheet and covered with a blanket. The patient's limbs and body are gently rubbed while in the bath, and on removing he should have a stimulant. Rectal temperature should be taken directly after the bath, and again forty-five minutes later. Should the patient be too weak for the bath, frequent sponging or Leiter's coils should be used.

Constipation.—Should constipation be present, though as a rule it does no harm, it is well every third or fourth day to give an enema. If a laxative is needed during the disease give Hunyadi-János water.

Hemorrhage.—Should hemorrhage exist it should be treated with full doses of opium and acetate of lead. Ice should be freely given, and food should be restricted for eight or ten hours. If there should be any symptoms of collapse give stimulants.

Diet.—The diet of a typhoid fever patient must be watched over with unceasing vigilance, as upon it and proper nursing, more than upon medical treatment, the chances of success often depend. In the first stages it should be light, entirely unstimulating and unrelaxing to the bowels.

No Solid Food.—Throughout the whole course of the disease no solid food ought to be allowed, and this precaution should be rigidly enforced on account of thereby avoiding the risk of mechanically rupturing some little hole in the intestine, at the seat of an ulcer which had almost perforated the wall of the bowel. Such a catastrophe must, as already hinted, lead to almost certain death.

Drink.—As the thirst is usually very great, whilst the appetite is nearly lost, it is a good plan to make the drinks somewhat nourishing in order to support the strength. Hence, gum-arabic water, barley-water, or milk thickened with tapioca, sago or cornstarch are often highly advantageous.

No Fruits.—If the usual tendency to diarrhœa is at all marked, fruits of all kinds ought to be entirely withheld by the nurse, and even where the bowels are not disordered, fruits and vegetables, other than those enumerated, should be very cautiously given, on account of the disposition to looseness of the bowels which generally exists. Many cases of death from typhoid fever may be directly traced to the murderous imprudence of nurses and attendants in this respect.

Diet for Second Week.—During the second week, when slight indications of debility usually begin to manifest themselves, a more nutritious diet becomes necessary. Thicker preparations of the farinaceous foods above mentioned should be employed, beef-tea and beef-essence may be added to the list, and as debility increases eggs beaten up with milk, flavored perhaps with a little wine, if they have been well borne during health, may be administered. In the latter stages, when the whole capacity of the enfeebled digestive organs is needed to take up sufficient food to sustain life, strong meat-soup, beef-essence, eggs beaten up with wine, and milk punch should alone be urged upon the patient.

Injected Food.—Life has apparently been saved in some instances by frequently repeated small injections of beef-essence, brandy and milk, with a few drops of laudanum, in order to prevent the enema from being rejected from the bowels, as is too often the case in spite of all our efforts.

Nursing.—In nursing the case of a typhoid fever patient, watchful and judicious care of a skillful attendant often contributes in those instances having a favorable termination, as most candid physicians will admit, more than medical treatment to the sick man's recovery. The suitable administration of medicines to control diarrhœa, acording to the varying phases of that important symptom; to relieve restlessness and allay excitement; the proper employment of baths to reduce febrile heat and diminish cerebral congestion; the constant guarding of the patient from injurious articles of food; the increasing effort to economize the failing strength, which otherwise may prove just a little lacking in the last great day of struggle with the disease, notwithstanding all the reinforcements called upon in the way of stimulants and nutrients to support it, all these offer an ample field for the highest intelligence and the noblest self-sacrifice.

Watching the Delirium.—The attendant upon a typhoid fever case must be on his guard, lest in his momentary absence the delirious patient gets out of bed and attempts to escape from the house, or perhaps throws himself out of a window. Even the effort at walking across the room may, in the weak conditions met with in the latter portion of the fever, so exhaust the failing strength as to lead to dangerous or fatal collapse.

Treating Bed-Sores.—The tendency to bed-sores, which are particularly apt to form over the portions of the body pressed upon in lying upon the back during typhoid and typhus fevers, must be overcome, as far as possible, by frequent change of position, the use of perforated pillows or cushions and of water-beds, and the patient should be well rubbed with alcohol twice a day, especial care being used over the parts of the body that the patient rests on while in bed, *i. e.*, back, buttock, and so forth. As a general rule, the formation of a bed-sore in a case of typhoid fever not lasting more than twenty-five to thirty days, is evidence of carelessness on the part of the nurse, and should never be permitted to occur. When once developed, bed-sores must be kept clean and carefully dressed once or twice daily, in the hope of preventing them from spreading, as the chance of curing them until the patient can sit up is exceedingly small. Not only is the suffering from bed-sores very great, but the free discharge of pus which they generally yield is extremely debilitating and quickly exhausts the little remaining stock of strength.

Typhoid Mortality.—The mortality of typhoid fever varies in different epidemics from 10 to 20 per cent. The older the patient the less is his chance of recovery from the malady, whilst among children the proportion of deaths is quite small.

Walking Typhoid.—Some of the mildest cases, those to which the name of "walking typhoid" has been appropriately applied, may suddenly terminate in perforation of the bowel, and death in a few hours from collapse or from peritonitis. On this account a typhoid fever patient, no matter how slight his symptoms of illness may be, should stay in bed, and swallow nothing but liquid food, until the searching test of the thermometer shows that all febrile movement has subsided.

Management of Convalesence.—Even after convalescence has fairly set in, great watchfulness is necessary. Permission to sit up in bed even ought not to be given until several days have passed without any fever, as proved by the thermometer, which should be used morning and evening throughout the complaint, and the return to solid food must be both slow and gradual. Any imprudence in diet, or slight over-exertion, may bring on a relapse, which is much worse than the original attack, and its causes ought therefore to be most seduously shunned.

Prevention of Typhoid.—The great means of preventing typhoid fever by unceasing vigilance in regard to the purity of the water-, milk- and air-supply has already been urgently insisted on.

CEREBRO-SPINAL FEVER OR SPOTTED FEVER.

Definition.—An infectious disease occurring sporadically and in epidemics, caused by a diplococcus, characterized by an inflammation of the cerebro-spinal meninges and symptoms of great pain in the head, back and limbs, convulsions, irregular fever, and at times petechial eruption.

History.—In 1801 Vieussens first described a small outbreak in

Geneva. There had been several outbreaks in the United States prior to 1875, but since that time there have been several extensive epidemics. There was a serious epidemic in Western Maryland in 1892, in New York in 1893, and from the spring of 1896 to the spring of 1898 the disease has prevailed extensively in Boston and its neighboring towns.

Causes.—Over-crowding, poor food, foul air and bad drinking water seem to be the predisposing causes. The epidemics have occurred most frequently in winter and spring. The concentration of individuals, as of troops in barracks, seems to be a special factor; in civil life children and young adults seem most susceptible.

Symptoms.—Many different forms have been described, but they are best grouped into three classes:

1. Ordinary Form.—This is a malignant epidemic fever, usually attended with painful contraction of the muscles of the neck and retraction of the head, and frequently accompanied by a profuse purpuric eruption. It is a disease which generally comes on suddenly, runs its course with great rapidity, and proves fatal in a majority of instances. The malady is more than a mere inflammation of the membranes of the brain, or meningitis, for the whole nervous system seems to be very gravely affected from the first.

Premonitory Symptoms.—Premonitory symptoms are rare, but when they are met with, show themselves simply as slight headache and pain in the back, or a little uneasiness and weariness experienced for several days before acute symptoms set in. These may commence with a chill or marked shivering-fit, followed by intense vertigo, headache of intolerable severity, obstinate and violent vomiting, painful muscular stiffness, soon developing into continuous spasms, affecting particularly the muscles of the head and back.

Head Distress.—Distress in the head is constant so long as consciousness lasts. The eyes are blood-shot, and express agonizing suffering, the pupils are contracted, and the countenance is pale. Excessive restlessness and general muscular agitation prevail, and the sensibility of the whole surface is so great that every touch and movement causes excruciating pain, and even touching the hair is painful.

Third Day Symptoms.—These symptoms increase up to the third or fourth day, when the power of swallowing begins to be affected, and the process of respiration to be imperfectly and irregularly performed, the head being dragged tightly back as far as possible, and the features fixed in the horrible and characteristic grin of lockjaw. The delirium usually developed during the third day, if it has not sooner appeared, passes into stupor, and this in its turn deepens into coma, from which or from suffocation death commonly releases the sufferer between the fifth and eighth day of the complaint, or in a few cases the patient may gradually improve, and after three or four weeks enter upon a tedious convalesence of many months' duration.

2. **Malignant Form.**—There is an abrupt onset with a chill, followed by vomiting, headache, moderate fever, convulsions and rash.

3. **Abortive Form.**—The disease begins abruptly with grave symptoms, but terminates in a few days in recovery.

Diagnosis.—The diagnosis between this disease—which, it should be stated, has also been named epidemic cerebro-spinal meningitis, or purpuric fever—and typhus fever, typhoid fever, tetanus or lockjaw, tubercular meningitis and typhoid pneumonia, is usually not difficult, except in the earliest stages. The fact of its epidemic prevalence generally aids at once to its recognition, except in the first few cases which occur, and even in these the intolerable headache, retraction of the head, and excessive sensitiveness of even the hair to the lightest touch, are almost always sufficient to characterize this strange and terrible malady.

Complications.—Deceptive vision from inflammation of the cornea or atrophy of the optic nerve; defective hearing from inflammation of the auditory nerve or from suppurative inflammation of the middle ear. Pleurisy, pericariditis and parotitis are not uncommon and headaches more or less severe may remain for months or years.

Treatment.—The treatment consists of dry or cut cups to the nape of the neck and along the spine, cold to the head by means of ice-bags or bladders, or better still the ice-cap, opium in quantities of a grain every two or three hours, and especially hypodermic injections of morphia, to relieve the agonizing suffering as well as for the direct curative effect which opiates seem to possess in some instances, and iodide of potassium, in full doses of five grains every four hours, is indicated during convalescence, and blisters to the spine are also highly recommended.

RELAPSING FEVER OR FEBRIS RECURRENS.

Definition.—It is an infectious disease caused by the spirochetes of Obermeier, characterized by a definite febrile paroxysm which usually lasts six days, and is followed by a remission of the same length of time, then by a second paroxysm, which may be repeated three or four times.

Cause.—This disease is also known as "famine fever" and "seven-day fever." The special conditions under which it develops are similar to those of typhus fever.

Symptoms.—Period of incubation appears to be short and in some cases the attack develops promptly after exposure, more frequently, however, from five to eight days. Its onset is usually abrupt, without any preliminary symptoms, and the febrile attacks, usually severe though of short duration, pass away leaving the patient comparatively well for a few days. After an interval of about a week, however, a repetition of the primary attack is experienced, and this relapse, from which the disease takes its name, may recur four or even five times.

Blood Germs.—Relapsing fever is remarkable for being the first human febrile affection of a paroxysmal character which has been definitely connected with the development of a vegetable organism in the blood. The peculiar vegetable organisms belonging to the spirochetes are found in the blood of relapsing fever patients by tens of thousands, and disappear during the temporary convalescene, to reappear with the recurrence of the febrile attack.

Symptoms Beginning.—The onset of the malady is marked by a chill or shivering-fit, severe headache, vomiting, and often jaundice; a white, moist tongue, tenderness over the pit of the stomach, constipation, enlarged liver and spleen, high-colored urine, a frequent, full and often bounding pulse, pains in the back and limbs, and frequently delirium.

Further Symptoms.—These symptoms abruptly terminate between the fifth and eighth day, as a general rule, by an exceedingly copious perspiration, and, after an interval of a week, during which it may be supposed that a new crop of the bacteria are ripening, and in which time the patient is often well enough to get up and walk about, a sudden relapse takes place, running through the same phases as the original outbreak, except, perhaps, that it is a little shorter.

At Death.—When death occurs, it is apt to happen from a fainting-fit, following excessive perspiration, or from coma, the result of suppression of the renal secretion, but as seen in America the fatality is very small, being on an average less than two per cent.

Diagnosis.—The diagnosis of relapsing fever cannot be positively made by the general symptoms during the primary onset, but may be strongly suspected, and the relapse looked for if the disease is prevailing, and exposure to the contagion has occurred. A microscopical examination of the blood during the height of the febrile movement will, however, determine the presence of the spiro-bacteria, and this investigation ought therefore always to be made.

1. **Treatment.**—Although so far advanced in our knowledge in regard to the vegetable nature of the true contagion of relapsing fever, we have

not yet made equal progress in the specific treatment of this complaint. The great problem, of course, is to find some mineral substance which can be taken up in the blood in sufficient quantities to check or prevent the growth of the bacteria in that vital fluid, without seriously injuring the patient himself. Quinine, so useful in intermittent fever, has proved almost worthless in this disease, and our chief reliance to reduce the high temperature is at present on cool baths or cold sponging.

2. For the Headache.—If the headache is very severe, dry cups to the back of the neck and along the spine may be employed, or one or two leeches may be applied behind the ears, although, since the tendency of the disease is toward great debility, it is better to avoid the abstraction of blood if possible. Opium or morphia by the stomach, or still better by hypodermic injection, is often necessary to relieve the headache and the severe pain in the limbs, and if symptoms of prostration come on early, wine or brandy must be resorted to.

3. The Urine.—A very careful watch must be maintained over the functions of the kidneys, since one of the great dangers of the disease appears to be the failure of these organs to perform their duty of purifying the blood from urea, which, when allowed by renal negligence to accumulate in the system frequently causes death by uremic poisoning. The urine should, therefore, be frequently examined, its total daily quantity noted, and the existence of albumen tested for. On account of its favorable action on the kidneys, sweet spirits of nitre in quantities of a teaspoonful every four hours is particularly applicable.

4. For the Pain.—For the muscular pains it is reasonable to expect that phenacetine, antifebrin or antipyrin will be of great service. The febrile paroxysm demands much the same treatment as typhus fever. Sponging or cold baths and nutritious and easily assimilated food.

FEBRICULA OR EPHEMERAL FEVER.

Definition.—A fever of short duration, depending on a variety of irritative causes. A febrile movement, lasting twenty-four hours and then disappearing, may for convenience be called ephemeral fever; if of three or four days' duration, febricula.

Causes.—The most frequent cause of this form of fever is probably the ingestion of foods difficult of digestion. As a rule dyspepsia is perhaps the most frequent cause of such a fever. This is especially the case with children, where it is often spoken of as gastric fever. Another cause is exposure to cold, insufficient to produce bronchitis, tonsilitis or some other affection too slight to be recognized by the usual signs.

Symptoms.—The symptoms of irritative fever are those usual to fever in a mild degree, *i. e.*, moderate elevation of temperature rarely above 103 degrees Fahrenheit, frequent pulse, flushed face, headache, sense of lassitude and weariness, loss of appetite, nausea and restlessness; in children perhaps delirium. The fever is apt to terminate suddenly by crisis on the third or fourth day.

Diagnosis.—Typhoid fever—at first the diagnosis may be impossible, but the absence of diarrhœa, tympanites, abdominal tenderness, spleenic enlargement and eruption will soon make the diagnosis apparent.

Treatment.—Absolute rest in bed, a liquid diet and repeated doses of calomel may be employed to relieve the constipation. The fever may be controlled by the following mixture:

Tincture of aconite root..........................	3 drops
Spirits of nitrous ether..........................	½ ounce

Acetate of liquid ammonia, add sufficient to make 3 fluid ounces.

A dessertspoonful every two hours for a child 4 years old.

PROTRACTED SIMPLE CONTINUED FEVER.

Definition and Cause.—It seems necessary for the present to continue this term for a feverish process of a longer duration than febricula—a fever of long duration that is not typhoid, nor influenza—lasting from two weeks to three months and without definite lesions may be put under this head. Cases of prolonged fever succeeding pneumonia and pleurisy which subsequently recover may well be ascribed to this disease.

Symptoms are, as will be readily understood from this explanation, slight chill or chilly feelings for the initial disturbance, followed in a few hours by headache, quickened pulse, rise in temperature and constipation. Very often in persons of sensitive stomachs there is a little nausea or vomiting for twelve or twenty-four hours, and again with those of sensitive skins there may be a slight eruption of roseola, or prickly-heat, as it is often called, especially about the loins and over the back. The fever may run high enough for the overheated blood to disturb the brain and produce some delirium, especially at night; but at the end of a period, varying in duration from twelve hours to ten days, the febrile symptoms usually subside without any further derangement of the system than a very copious and debilitating perspiration, or perhaps an outbreak of the vesicles of herpes, commonly denominated "cold sores," about the face or elsewhere. Such attacks as these cause much needless anxiety, needless at least in the Northern States, to both physicians and patients, the former dreading the onset of typhoid fever or other dangerous disease, and the latter suffering an agony of suspense from which, for a time, all the knowledge of Hippocrates or Æsculapius himself could not deliver them.

Treatment.—The patient in these puzzling cases should be kept in bed, and allowed only light unstimulating liquid food. Cold applications may be made to the forehead and temples to relieve headache and diaphoretics combined with anodynes, such as nitre and morphia, as already directed, to reduce fever and allay restlessness: Lumps of ice are useful and refreshing to the throat when swallowed and whilst there is constipation, ripe, sweet oranges in moderation are generally safe.

YELLOW FEVER.

Definition.—An acute infectious disease characterized by yellowness of the skin and accompanied in the severer cases by black vomit, suppression of the urine, with hemorrhage from the stomach, nose and mouth. It is almost peculiar to tropical climates and not apt to spread in temperatures below 72 degrees Fahrenheit; it is extremely fatal, perhaps, communicable from person to person and in the United States has occasionally proved itself violently epidemic.

Causes.—A hot climate, warm season, salt water, bad drainage and over-crowding favor the development of epidemics. The negro is less susceptible than the white. Strangers in an infected district are more liable to be attacked than the residents. One attack usually confers immunity from others. The exciting cause is the bacillus of Sanarelli.

Symptoms.—Yellow fever presents three well-defined stages. The first is characterized by intense pain in the head and back, injected eyes, rapid pulse and elevated temperature. This stage may last from twenty-four hours to six days—according to the severity of the attack, nausea and vomiting are present and become more intense on the second or third day. The bowels are usually constipated. As early as the first morning according to Guitéras, the face is decidedly flushed, more so than in any other infectious disease at such an early period. The second stage is characterized by the following symptoms:

The Pulse.—One of the diagnostic signs is that with an ascending temperature, there will be a descending pulse. On the first day the pulse is rarely more than 100 or 110; on the second or third day while the temperature keeps up the pulse begins to fall and may become slower to the extent of twenty beats. On the evening of the third day there may be a temperature of 103 degrees and a pulse of 75; it may, during defervescence stage, go down as low as 30.

The Fever.—On the morning of the first day the temperature may vary from 103 degrees to 106 degrees; during the evening of the first day and the morning of the second day the temperature keeps about the same. There is a slight diurnal variation in the second and third days.

The Calm Stage.—Third stage, the remission or stage of calm, as it has been called, is succeeded by a febrile reaction, or secondary fever, which lasts one, two or three days and in favorable cases falls by a short lysis. On the other hand, in fatal cases the temperature rises rapidly, becomes higher than in the initial fever and death follows shortly. The second stage is marked by depression of the nervous and muscular forces, and of the general and capillary circulations, slow and intermittent pulse, jaundice, urinary suppression, passive hemorrhages from the bowels, nose, gums, uterus and nearly all the organs lined with mucous membranes and, in cases of unusual severity, also from the eyes, ears and skin. Black vomit, delirium and coma generally terminate in death.

In more severe cases the symptoms resemble to a considerable extent those of relapsing fever, and it is impossible to foretell from any of these indications how serious these consequences may prove to be. In truth, these sequels constitute the most distinctive characteristics of yellow fever and comprise the "black vomit," so well known and dreaded as a fatal symptom. The black vomit is frequently preceded by the white vomit, as it is called, which is a clear acid liquid and at this time some pain is usually felt on pressure over the pit of the stomach. The occurrence of this black vomit is well known, even among sailors to West Indian ports, as a fatal sign in yellow fever, although occasionally a patient recovers after this gloomy harbinger of death has manifested itself. The yellow-jaundiced hue of the skin, when well marked, indicates a severe form of the disease, but has by no means the terribly fatal import of the black vomit.

1. **Prognosis.**—There are epidemics in which all persons attacked are seriously ill or die. There are epidemics of medium intensity in which the progress of the disease is limited and the mortality low. Finally, there are mild epidemics in which nearly all the patients recover. The virulence of the epidemics seems to depend upon the month in which it is imported. The pathogenic bacillus increases in virulence in the months of May, June and July. On the other hand the epidemics which are imported in the months of August, September and October are very mild owing to the attenuation of the bacillus.

2. The Individual Attacked.—Should the patient prior to his attack have been addicted to the use of alcohol, should he be debilitated from overwork, sexual excesses or bad living, and lastly, if he be old, the prognosis is against his recovery. The younger, the healthier and stronger the patient the greater are his chances for recovery. When the fever reaches its maximum at the onset and defervescence is continuously noted at each visit, the disease is mild; even when the fever ranges between 103 and 104.5 degrees Fahrenheit during the first three days with a remission of at least a degree in the morning and the exacerbations are less and less pronounced each night, the patient always gets well. When the fever ranges between 104 and 105 degrees Fahrenheit, still with remissions of at least a degree, but with exacerbations above the degree of fever of the previous day, the disease is to be considered grave. The cases of recovery are more numerous than the fatal ones even here. But when the fever reaches 105 degrees Fahrenheit or above within the first twelve hours the disease is usually fatal, unless heroic treatment immediately produces a defervescence of two or three degrees. Copious urine is always a good augury, even should it contain five or ten per cent. of albumen.

Scanty Urine with twenty to twenty-five per cent. of albumen on the second day, accompanying a fever about 104 degrees, indicates great danger. When the urine forms a complete coagulum on being heated death is certain. When anuria lasts twelve hours death is absolutely certain.

Intense Jaundice on the third day, urine scanty and albuminous, with black vomit occurring at the same time, always results fatally.

Black Vomit is less grave in children and in young women than in adults, particularly those over forty years of age; the latter always die.

Profuse Bleeding of the gums coming before or at the same time as the black vomit indicates an almost desperate state. Should it, however, occur on the fourth day and the gums being sound, the prognosis is less gloomy.

Women having uterine hemorrhage on the fourth and fifth days with black vomit never recover.

Treatment.—There are two great principles to be carried out in the treatment of yellow fever:

1. To strengthen and sustain the organism by fortifying the nervous system, by arresting congestion and by increasing the blood pressure and diuresis.

2. To consume, destroy and eliminate the toxin.

First of Above.—The first of the above is met by means of cold sponging by cold baths, administered not in a routine way, but by taking the virulence of the disease and the degree of the fever as a guide.

Second of Above.—The second indicaion is met by putting the patient in a well aerated room, night and day, and making him drink in order to cleanse his blood and to dilute the toxin and eliminate them by way of the urine, two to four quarts of Vichy water in twenty-four hours.

It is during the first three days of the disease that the physician must act.

Absolute Rest.—Put the patient to bed, rest is essential and indispensable, walking, moving or the least muscular effort always increases the fever, and consequently the disease.

Aeration of the Room.—The patient must be placed in the largest and best ventilated room in the house. Exposed to the rising sun if possible. Keep the windows open night and day; do not let patient be in a draught but let the outside air enter and circulate freely.

Cleanliness.—The patient must be kept clean; should he be soiled by evacuation of the bowels or vomit, change the linen at once and plunge the soiled clothes in an antiseptic solution; cleanse the patient's teeth twice a day with cooking soda and warm water. Administer morning and night an enema containing a pint of warm water and a tablespoonful of sulphate of magnesia.

The Urine should be examined each day to see how the kidneys are acting.

Treatment of the Vomiting.—Let the patient eat small pieces of ice, but absolute rest for the stomach is the better plan.

Nourishment.—None should be given for the first seventy-two hours, after that milk every four hours. Starve your patient whether he be child or adult, unless the fever be below 102 degrees Fahrenheit. Vichy water in large quantities should be given from the onset of the disease.

Medicinal Treatment.—At the onset give one to three grains of calomel, depending on the age of the patient, but not enough to purge. In desperate cases enemas of strong black coffee to which is added two tablespoonfuls of brandy have been found beneficial.

The latest writers on yellow fever claim that the disease is spread by the mosquito. In Havana the following experiment was tried: Four men were used who had never had the disease and they were put in one room, but two were separated from the other two by a wire netting which was impervious to the mosquito. Clothes from a yellow fever patient were put into both compartments, in fact beds which had held yellow fever patients were supplied for the men to sleep on. In one compartment the mosquitoes were allowed to go in and out and the men bitten by the insects contracted the disease, but the other two men who were subjected to the same condition, minus the mosquitoes, did not contract the disease.

Yellow Fever and Mosquitoes.—A theory, lately come into vogue, is that yellow fever is imparted to the system by the bite of mosquitoes. The Surgeon-General of the United States has issued rules for the exclusion, by netting, of mosquitoes from houses, army tents, and so forth.

BUBONIC PLAGUE.

Definition.—An acute infectious disease, which is identical with the pestilence of India and the black death of Europe in former ages, and is attended with buboes or boils of the lymphatic glands of the groins, as well as other glands and occasionally with carbuncles. It is very easily communicated by human intercourse and is probably the most fatal of all the eruptive fevers.

Cause.—The specific bacillus which causes this disease was discovered by Kitasato, and occurs in the blood and in the organs of the body. It obtains entrance through the digestive and respiratory tracts.

History.—The earliest positive accounts dates from the second century of our era. From the great plague in the days of Justinian (sixth century) to the middle of the seventeenth century epidemics of varying severity occurred in Europe. Although the inhabitants of the United States have hitherto been spared any visitation from the plague, yet, as the shipments of rags from Italian ports with marble, for which they are used as wrapping is carried on quite extensively, germs of this terrible malady may at any time be imported and planted within our borders. In the last great outbreak of plague in Astrakhan, a province of southeastern Russia, the starting-point of the whole epidemic was, it is said, traced to a shawl brought by a Cossack returning from the war in Afghanistan, as part of his booty, and presented to his sweetheart. The girl wore the fatal gift for a few days, when she sickened with all the symptoms of plague and died. During the following four days the rest of her family, six in number, sickened and died. From these poor people the disease spread rapidly, and proved very fatal, devastating nineteen villages in that district. Its deadly march was only checked by a double cordon of soldiers being placed around the infected towns, and absolute non-intercourse, on the plan of the shot-gun quarantines of our Southern States, enforced.

Symptoms.—In the milder cases, patients are attacked with violent headache, transient shiverings, alternating with intense heat of skin, sometimes terminating in death from prostration. In the more severe form the persons affected are suddenly seized with palpitation of the heart, irregularity of the pulse, vomiting, difficulty of breathing, spitting of blood, and syncope or fainting. The face becomes pale, the expression apathetic, the eyes dull and the pupils dilated. The patients lie for three or four hours in a state of absolute prostration and then a violent accession of fever with delirium followed, in which the urine is suppressed and the bowels constipated. Dark purplish spots, from one-tenth of an inch to one inch in diameter, appear over the body, which exhale a peculiar odor somewhat resembling honey, and death is preceded by lethargy and collapse. The corpses become putrid in two or three hours after decease. Death sometimes occurs in twelve hours from the first onset.

The fever may reach 104 degrees or 106 degrees Fahrenheit, and the tongue becomes brown. The inguinal glands are most often affected, then in order, the axillary, the cervical and the popliteal. Carbuncles also develop in different parts of the skin, particularly on the legs, buttocks or back.

Treatment.—Free stimulation, nutritious food, as in the most adynamic forms of typhus and typhoid fever together with cool baths to combat the fever, are the measures indicated. Antiseptic treatment of the abscesses should be practiced.

MALARIAL FEVER.

Definition.—An infectious disease characterized by: (a) paroxysms of intermittent fever of quotidian, tertian or quartan type; (b) a continued fever with marked remissions; (c) certain pernicious, rapidly fatal forms; (d) a chronic cachexia, with anemia and an enlarged spleen.

1. Causes.—Geographical Distribution—In Europe, Southern Russia and certain parts of Italy are now the chief seats of the disease. In the United States malarial fever has progressively diminished in extent and severity during the past fifty years. From New England, where it once prevailed extensively, it has gradually disappeared. In Philadelphia and along the valleys of the Delaware and the Schuylkill rivers, formerly hot beds of malaria, the disease has become much restricted. Throughout the Southern States there are many regions where malaria still prevails, but the disease has much diminished in extent and intensity.

2. Soil Conditions.—The importance of the state of the soil in the cause of malaria is universally recognized. It is seen particularly in low, marshy regions which have abundance of vegetable growth, estuaries, badly drained, low lying districts, the course of old river beds and particularly low lying land which has been allowed to fall out of cultivation, are the favorite localities for the development of malarial fever.

3. **Seasons.**—In temperate regions, like the Central Atlantic States, there are only a few cases in spring, usually in the month of May and a large number of cases in September and October.

4. **Heat.**—A tolerably high temperature is one of the essential conditions for the development of the virus. It is more prevalent after prolonged hot summers.

AGUE OR INTERMITTENT FEVER.

Symptoms.—Characterized by three distinct stages of fever, chill and sweat. The paroxysm is usually preceded by a feeling of uneasiness and discomfort, sometimes languor and yawning, which forewarns the patient of its coming.

1. **The Chill or Cold Stage.**—Begins gradually; first there is a creep, then another, a little more severe, then another, each growing in severity until the teeth chatter and the body shakes violently. Not only does the patient look cold, but a surface thermometer will indicate a reduction of the skin temperature. The rectal temperature during the chill may be greatly increased. It lasts from fifteen minutes to an hour.

2. **The Hot Stage.**—Next comes the hot stage, in which all the symptoms of fever are manifested, comprising headache, nausea or vomiting, heat of skin, which may attain an elevation of 105 degrees, full strong, rapid pulse and occasionally delirium lasting from a half hour to four hours. After this follows the sweating stage, during which profuse perspiration takes place and the temperature is reduced, as a consequence, nearly or quite to the natural standard. The paroxysms, thus constituted, generally recur with considerable regularity, but may vary a good deal in different cases in regard to the interval between them.

Varieties of Ague.—The varieties of ague designated in accordance with this difference are, first, the quotidian or daily ague, in which the fit comes on usually at the same hour every day; second, the tertian ague, the most common form, when the paroxysm returns every forty-eight hours whilst the disease continues; third, the quartan, where the fit occurs every seventy-two hours, or on every fourth day; and fourth, the irregular ague, in which the fits are not distinctly periodical. Under this head is included the kind of periodical neuralgia affecting the forehead, and hence denominated brow-ague. In the quotidian form the paroxysm is apt to be the most prolonged and may last for sixteen hours out of the twenty-four, leaving of course only eight hours between its termination and the commencement of a new chill; in the tertian form, the fit is less protracted, lasting on an average about ten hours; and in the quartan it is still shorter, having an average duration of only six hours. In a fit of tertian ague continuing ten hours, we may expect to find the chill lasting from half an hour to an hour, the febrile stage, during which the patient often declares he feels as though he were burning up, extending over from three to five hours and the sweating stage occupying the remainder of the time.

Complications.—The most common secondary affection which occurs in the course of intermittent fever, and appears to be directly dependent upon it, is the chronic enlargement of the spleen, called "ague-cake." During the cold stage of the fit, it is probable that the spleen is always more or less distended with blood, which, being driven from the surface of the body whilst the chill lasts, finds its way to the internal organs and especially the spleen, in unusual quantity. Such congestion, if frequently repeated, seems to lead, in a majority of cases, to a real increase in amount of the structure of the spleen, and consequent enlargement of the organ.

The Ague-Cake.—The "ague-cake," when fully developed, may attain a magnitude of a foot or more in length by ten inches in breadth, and even when much smaller than this may be felt as a hard, painful and movable tumor, on the left side of the abdomen, a few inches below the heart. Such increase in size of the spleen generally indicates a rather profound impression of the malarial poison upon the system, and renders the prospect of speedy cure far less hopeful.

Lack of Blood.—Another serious complication of prolonged ague is the intense anemia, which so many persons who suffer from malarial poisoning often exhibit to a marked degree. The absence of the natural supply of good, rich, red blood gives to the skin, and especially that of the face, a dull, yellowish tint, which in malarious regions is displayed by most of the inhabitants, even the children exhibiting a pallid sallowness pitiful to behold. There is also a peculiar dejected, woe-begone expression of countenance, which is almost characteristic of malarial poisoning, and feelings of muscular weakness and fatigue on the slightest exertion are very common.

Diagnosis.—The diagnosis of ague is seldom difficult after the first paroxysm, as the regular recurrence at the same hour of the day is a feature which is so characteristic that it has given the name of "periodical fevers" to the febrile affections caused by malaria. At the first onset, it is impossible to distinguish the chill from the initial symptom of a great number of diseases, but a microscopical examination of the blood will quickly decide. The plasmodium of malaria is found in the blood during the paroxysms.

Treatment.—In the medical treatment of all the periodical fevers, we fortunately possess a specific of wonderful power in quinine and the other alkaloids of Peruvian bark, which have a direct control over the malarial poison, by checking the development of the *bacillus malariæ*, which has been already referred to as being the cause of ague.

Quinine Treatment.—It is the custom to prepare the system for the administration of quinine, by the purgative action of full doses of blue-pill or other active cathartic. Give quinine in sufficient doses, during the sweating stage, to produce the slight deafness and ringing in the ears which mark the occurrence of cinchonism, as it is denominated. As a general rule, it is quite possible to do this before the time for another paroxysm, even with an attack of intermittent fever of the quotidian type. The antiperiodic must, however, in order to effect a cure, be continued in full doses of from ten to thirty grains daily, for three or four days, then reduced to half or one-third this quantity for a few days, and so persevered in for three weeks.

Preventing Fever Recurrence.—For the purpose of counteracting the tendency which intermittent fever possesses of recurring in its original violence at intervals of exactly one week, it is advisable to take the full dose of from ten to thirty grains, or whatever amount has been found to produce slight buzzing in the ears, on the sixth and seventh, the thirteenth and fourteenth, and the twentieth and twenty-first days from that on which the last chill was experienced. In this way not only the periodicity of single ague-fits, but also the periodicity of groups of the intermittent fever paroxysms, appears to be most effectually extinguished.

An East Indian Cure.—In case quinine fails or is not tolerated, other alkaloids of Peruvian bark, and preparations of the bark itself, should be fairly tried. A famous East Indian mixture for the cure of ague is Warburg's tincture, and it may be resorted to when ill-success with other forms has been met with.

Use of Peruvian Bark.—The alkaloids of Peruvian bark are, as a rule, much more efficacious in solution with some mineral acid, such as the dilute sulphuric acid.

Other Treatments.—Where for any reason Peruvian bark and its preparations fail to cure ague, the best substitute, although a far inferior one, is probably arsenic, particularly in the form of Fowler's solution, administered in quantities of five drops thrice daily, and formerly well known under the name of the tasteless ague-drop. For the cold stage, wrap the patient up well in blankets and apply hot-water bags, besides giving hot drinks. For the fever, cool sponging will relieve the patient.

Diet.—No particular care of the diet is requisite in intermittent fever, except to counteract as far as possible the tendency to anemia and general debility, by a liberal supply of the most nutritious food which the digestive powers are able to assimilate. In like manner, as the patient is not confined to bed, directions about nursing are unnecessary.

Prevention of Ague.—The remedy to be used in preventing an attack of malarial poisoning, when temporary residence in a fever and ague district is unavoidable, is quinine used internally, as already suggested, in doses of six or eight grains daily.

THE MORE IRREGULAR, REMITTENT OR CONTINUED FEVERS.

Place and Seasons.—This type of fever occurs in temperate climates, chiefly in the later summer and fall; therefore it is sometimes called estivo-autumnal fever. The severer forms of it prevail in the Southern States, where it is known as the bilious remittent fever. The entire group of cases included under the term remittent fever are bilious, remittent and typho-malarial fevers.

Symptoms.—These, as to be expected, are often irregular. In some instances there may be regular intermittent fever, occurring at uncertain intervals of from twenty-four to forty-eight hours, or even more. In the cases with longer remissions the paroxysms are longer. Commonly, however, the paroxysms show material differences; their length averages over twenty hours, instead of ten or twelve; the onset occurs often without chills and even without chilly sensations. The rise in temperature is usually gradual and slow, instead of sudden, while the fall may occur by lysis instead of by crisis. There is a marked tendency to anticipation, while frequently from anticipation of one paroxysm and retardation of another more or less continuous fever may result. In the cases of continuous and remittent fever the patient, when seen early in the disease, has a flushed face and looks ill, the tongue is furred, the pulse full and bounding, but rarely dicrotic. The temperature may range from 102 degrees to 103 degrees or go even higher.

Diagnosis.—The diagnosis of remittent malarial fever may be definitely made by an examination of the blood. The small, actively, motile, hyaline forms of the æstivo-autumnal parasite are to be found, while if the case has lasted over a week, the larger crescentic and ovoid bodies are usually seen.

Treatment.—The treatment of remittent fever is essentially that of intermittent fever. The continued nature of the fever and the tendency to a typhoid state demands a liquid diet, with the careful addition of stimulants.

PERNICIOUS MALARIAL FEVER OR CONGESTIVE CHILL.

Character.—Pernicious malarial fever differs in no respect from ordinary ague and bilious remittent, except in its greater severity. The disease is observed under three forms: First, the comatose or apoplectiform, the patient speedily loses consciousness, as though the chief force of the poison was expended upon the brain, disturbing its functions to such an extent as almost to abolish them. The fever is usually high and the skin hot and dry. Should the patient regain consciousness a second attack may come on and prove fatal.

Second Form.—In the second or algid form the symptoms of intense chill are prolonged, it may be for some hours, and death occurs in fatal cases from pure debility or asthenia, without reaction coming on. Although the patient is apathetic, the mind remains clear to the last. Vomiting and purging are the prominent symptoms, and the disease might readily be mistaken for Asiatic cholera, if it happened to occur whilst an epidemic of that malady was raging, were it not that the urine is never albuminous.

The Hemorrhagic Form.—In the third group of cases, denominated hemorrhagic malarial fever, the prominent peculiarity is bleeding, generally from the kidneys, but sometimes from the stomach, bowels, nose and mouth.

Diagnosis.—As one might expect, the blood shows marked changes in malarial fever. In the regular intermittent type there is a loss in the red corpuscle after each paroxysm, which may be considerable, but which is rapidly compensated for during the intermissions. In the estivo-autumnal fever the losses are often greater and more permanent.

Treatment.—As in the other kinds, give quinine, but in larger doses. In the case of the pernicious disease to get the effect more rapidly give quinine hypodermically as much as thirty grains at a time. Excessive care must be used to avoid abscesses.

Quinine sulphate	60 drops
Saturated solution tartaric acid..............	68 "

Distilled water to make 2 drachms.
Take 30 drops three times daily.

In addition to the use of quinine, stimulants must be given for the asthenia, artificial heat for the low temperature. Morphine hypodermically to relieve pain and allay nausea.

CHOLERA MORBUS.

Definition.—An acute gastro-intestinal catarrh, characterized by profuse vomiting, purging and painful cramp.

Causes.—This malady, which is not contagious, occurs at times almost as an epidemic, and is occasionally fatal, so that no instance of it, however mild at first, ought to be allowed to run on without treatment. Although generally induced by indulgence in indigestible food, especially unripe fruits, there seems to be at certain seasons of the year some external influence promoting the tendency to disorder of the bowels, which is atmospheric. Especially frequent are these attacks in July and August. Cold and dampness are also regarded as predisposing agents.

Symptoms.—The primary symptoms are uneasiness at the pit of the stomach, nausea, retching and then vomiting, followed by severe watery diarrhœa, consisting of a large amount of the watery portions of the blood, and containing only a little albumen. The whole system is thus affected, in part by sympathy, but also to some extent, it is probable, by the change in the specific gravity and constitution of the blood. The attack is often abrupt, a patient being awakened out of sleep by a sudden seizure during the night. This is, however, no doubt because the preliminary uneasiness, nausea and slight colicky pains, which manifest themselves in a diurnal onset of the malady, are unfelt in the unconsciousness of profound slumber. The vomiting and purging, when once commenced, recur in rapid succession, and sometimes even simultaneously, and enormous quantities of fluid are evacuated from the system, often with the result of producing intense thirst. This thirst cannot, however, be gratified for some time, because the irritable stomach refuses to retain the smallest amount of fluid. Collapse may supervene and the skin become cold, clammy and ashen hued, the eyes sunken and the pulse frequent and feeble.

Diagnosis.—The only difficulty about the diagnosis of cholera morbus or sporadic cholera is when true Asiatic cholera is epidemic, then, if a microscopical examination of the dijecta be made, will, if it be Asiatic cholera, reveal the comma-shaped bacillus.

Treatment.—For the pain in abdomen hot applications, morphine, one-quarter grain, hypodermically; to be repeated when necessary. When the pain is less severe opium may be given by the mouth or rectum in the form of laudanum—ten drops by the mouth or twenty-five drops in a tablespoonful of thin starch by the rectum. When vomiting is the most troublesome symptom the following is beneficial:

Morphine sulphate	1 grain
Creosote	6 drops
Bismuth subnitrate	2 drachms

Mix and put into 12 papers. Take one every hour.

The prostration requires stimulants like aromatic spirits of ammonia, thirty to sixty drops at a dose or whiskey, and so forth.

ASIATIC CHOLERA.

Definition.—An acute infectious disease, due to the implantation of the comma bacillus of Koch, characterized by vomiting, purging, rice-water evacuations and suppression of urine.

History.—It first made its appearance in the United States in 1832. Since that time there have been several epidemics, all of which are traceable to immigration. The most serious epidemic of recent time started in India in the spring of 1892, passing from thence to Persia, Austria, Germany and Holland. A few cases reached London and New York.

Causes.—The disease-poison of cholera undoubtedly reproduces and multiplies itself during the course of the complaint, being propagated by a contagion, given off mainly, if not entirely, by the evacuations from the bowels, in which the germs of disease propagate themselves, even after their discharge, so that the stools become more virulent after they are passed, especially when mixed with water. The extended researches of Dr. Koch have proved beyond all question the existence of the cholera germ (*comma bacillus*) in drinking water, and traced its development in the intestines of persons who had died of the disease. The illustration in the margin shows the appearance of this cholera germ, which it is so important for every one at the peril of

The Cholera Germ.

his life to avoid. When magnified about six hundred diameters one of the minute intestinal glands may be found to contain, as shown at *a*, *b* and *c*, minute bacteria or bacilli, as they are technically called, which, from their resemblance to the curved portion of a comma, but without the head of that punctuation mark, have been named the *Comma bacilli.* Some times these bacilli unite at their ends with their curves turned in opposite directions, so as to produce an S shape, or even a spiral formation.

This Comma Bacillus is the direct cause of cholera by its lodgment in the intestines, where it has been proved, by examination of nearly one hundred cases, to develop with great rapidity. It is easiest to detect in the earlier stages of the disease, because later on it is obscured by the development of a great many other forms of bacteria. It is distinctive of the mildest as well as of the most severe attacks, and has therefore an important diagnostic value. It is capable of successful cultivation in meat broth, in milk, on slices of potato, and especially on gelatine, in which it grows in a singular manner, producing a gradual liquefaction of the stiff gelatine around the growing colony, which sinks down into the jelly in a peculiar way. The comma bacillus thrives best at temperatures between 70 degrees and 135 degrees Fahrenheit, but is not destroyed and only has its growth checked by a cold of 18 degrees below the freezing point. It is, however, readily killed by drying, by the removal of all animal material upon which it can feed, or by acidifying the medium in which it is growing with a mineral acid. Under ordinary circumstances the bacillus when swallowed is destroyed by the gastric juice being digested in the stomach, but when there is any derangement of the stomach, from errors of diet or any other cause, so that the acid digestive liquid is deficient or absent, the bacillus escapes destruction, and may pass on into the intestine where the fluids are alkaline and it is able to develop with great rapidity. This fact in regard to the growth of the bacillus in alkaline fluids solely is one of great importance, not only in regard to the treatment of cholera, but also in connection with the subject of diet, since it is obviously highly necessary to avoid everything which, by producing indigestion, could interfere with the production of the precious gastric juice.

Modes of Infection.—In cholera epidemics we have, says Dr. Koch, instances amounting to actual experimental infection of man, as, for example, in the infection of those engaged in washing linen soiled with the discharges from the bowels of patients affected with cholera. An event of this kind is reported in the first outbreak of cholera in this country, when it was introduced into Quebec forty-two years ago.

Infection by Clothing.—Linen or other clothing soiled with choleraic discharges contains the bacilli often in a pure form, and if infection occurs through this medium it must be by the comma bacilli, frequently the only microscopic organism present, except those which are known to be innocent.

Infection by the Hands.—The hands of a person washing or handling such clothes may be soiled, and the bacilli introduced into the mouth by direct contact, or through the food which thus becomes contaminated, or the washing water may come in contact with the lips, and thus in some way the human being be fed with an extremely minute quantity of a pure culture of the comma bacillus.

Infection by Water.—When Dr. Koch was investigating the disease in India he observed an instance in which a certain tank furnished the water for drinking and other purposes to many people among whom the cholera was raging. He found the comma bacilli in this tank, and learned on inquiry that the clothes of the patients were washed in it. Around the tank were some thirty or forty huts inhabited by upward of two hundred people, and of these persons seventeen died, whilst the number of those taken sick was not ascertained. The tank in this case also received the refuse from the dwellings. In fact, it is common in India for the Hindoos to bathe in the tank which affords their water-supply, to wash their utensils in it, to deposit their excrement upon its bank, and if a hut has a latrine, or substitute for one, its outflow is apt to be into the tank. In this particular instance it was found, after a time, that the bacilli became less abundant in the tank-water, and coincidentally the cholera declined among the inhabitants of the huts along its shore. Here, if the epidemic had been the cause of the bacilli, instead of the result of their development, the number of these minute organisms ought to have been augmented after the disease began to be less violent. For further dissemination of the disease, the cholera discharge must be retained in a moist state, since complete drying seems to destroy the poisonous property of the virus; and this view is sustained by what we have long known in regard to the spreading of cholera by contaminated water-supply, or more directly by soiled hands, or even conveyance by insects, as, for example, by blow-flies alighting upon meat and other food. Drains may be infected, and through them the drinking water polluted; but as the virus cannot preserve its activity in a dry state little can be hoped for from aerial disinfection, nor does it seem probable that, except under certain conditions of unusual moisture can cholera be transmitted by merchandise or by letters, even if the latter are not disinfected, but only by human intercourse.

Symptoms.—Period of incubation ranges from two to five days. The symptoms of cholera commonly present themselves sufficiently gradual to admit of arrangement into three distinct groups or stages:

1. **Preliminary Diarrhœa.**—This may set in abruptly without any previous indications. More commonly there are for one or two days colicky pains in the abdomen, with looseness of the bowels, perhaps vomiting, with headache and depression of spirits. As a rule the temperature is not elevated.

2. **The Stage of Collapse.**—Spasmodic griping pains are felt and depression of the powers of circulation and respiration come on, attended with a sense of faintness and oppression over the heart, whose beat at times is hardly discernible, and the pulse at the wrist may be absent. Copious purging, at first of the contents of the intestines, and afterward of a thin, watery fluid, resembling water in which rice has been washed, having an alkaline reaction, and sometimes tinged red with blood, soon commences, and is usually accompanied with violent vomiting and a sensation of burning heat in the stomach. In a short time, perhaps within a few hours, there results from this excessive drain upon the circulation, coldness and dampness of the whole surface of the body, lividity of the lips, cold breath, an unquenchable thirst, a feeble rapid pulse, difficult respiration, with extreme restlessness, and suppression of the secretion of the kidneys.

Symptoms in Fatal Cases.—In fatal cases are noticed blueness of the whole body, the sunken and horror-stricken countenance denominated the Hipprocratic face, popularly known as the appearance of being struck with death, and a peculiarly suppressed voice, this condition ending either immediately in fatal collapse or in reaction followed by violent secondary fever.

3. **Stage of Reaction.**—This is characterized by return of warmth and colds, the latter more slowly and the reëstablishment of secretions. Especially favorable is the return of the urinary secretion. Along with these changes the vomiting and purging occur at longer intervals. The heart's action becomes stronger, and there are no abdominal pains. Not infrequently this favorable condition is interrupted by a recurrence of a severe diarrhœa, and the patient is carried off in a collapse. Other cases pass into a condition of what has been called cholera-typhoid, a state in which the patient is delirious, the pulse rapid and feeble and the tongue dry. Death finally occurs with coma. These symptoms have been attributed to uramia.

Diagnosis.—The only affection with which Asiatic cholera could be confounded is the cholera morbus, which occurs as a rule during the summer months, of which mention has been made.

Preventive Measures.—Preventive measures are all important, and isolation of the sick with thorough disinfection have effectually prevented the disease from obtaining a foothold in either the United States or in England.

The course of cholera during the last epidemic which visited the United States, and ravaged the Mississippi Valley in 1873, reaffirmed the lessons of previous outbreaks of this disease abroad. This was especially the case as regards the supreme importance of pure water-supplies in cities and villages, all of which should be boiled before using, and of having all wells and water-springs which are used by the people effectually guarded against any possible soakage and contamination from privies and other sources of defilement by excrement. It must be admitted that the history of outbreaks of cholera, in all parts of the world, conspicuously illustrates the vital importance of procuring all supplies of drinking-water from sources which cannot become polluted by the soakage into them of intestinal dischages, or from outflowings in any such way as to be carriers of bowel-diseases, particularly not of cholera and typhoid fever. The story of the Broad street pump in London, which killed five hundred people in one week during the last great cholera epidemic, and was found to have its water contaminated by soakage of cholera evacuations from an adjoining cess-pool, has already been related (see Book III), but it should be retold to every one as a terrible warning against the almost universal dangers of water-pollution. An item in the London *Lancet*, printed in 1882, states that a recent analysis of the water of the Holy Well of Mecca, which is so eagerly drunk by the pilgrims, as a part of their religious rites, shows the water to be sewage, about ten times stronger than the average London sewage. And during the same month that this report was given, came the news that the cholera had made its usual annual appearance among the pilgrims to the shrine of Mahomet in the Holy City of Mecca. It therefore appears extremely probable that by suitable investigation of the water of the Holy Well, there might be found in it a perennial supply of the cholera germs, and such a demonstration of the true origin of the frightful cholera epidemics which, spread by the caravans of returning Moslem pilgrims, have so often devastated large sections of Europe and Asia, would be a triumph for experimental hygiene of which the whole world of science might be proud.

The impurity of the local atmosphere of a dwelling, a village, or a particular district, is proved to be a matter also of public concern, and environed in a polluted atmosphere, the palatial mansions of wealth and gayety may suffer equally with the tenements of the humblest classes. The specific migratory power of cholera, whatever its nature, has the faculty of infecting districts in a manner most detrimental to health only when the atmosphere is fraught with certain products, susceptible under its influence of undergoing poisonous transformations. Through the unpolluted atmosphere of cleanly districts it migrates perhaps without a blow because that which it can kindle into poison is not there.

Disinfection.—1. The vomited matter and the discharges from the bowels are to be gathered and put in a carbolic solution one to twenty, or chlorinated lime one to ten, some of which should be in the vessel before it is used. In the country where the excreta can be thrown in a pit, "whitewash" is a cheap disinfectant.

2. After vomiting the mouth of the patient should be rinsed with a solution of hydronaphthol one to five thousand, care being taken that none of it is swallowed. After each evacuation from the anus the buttocks and thighs should be washed with soap and water.

3. All body and bed linen soiled with the discharges should be immediately moistened with a carbolic solution one to sixty, removed from the apartment in a covered vessel and boiled for one-half hour in a one per cent. solution of washing soda.

4. Napkins, towels, and so forth, should be treated in like manner.

5. All dishes, knives, forks, spoons, and so forth, after each meal, should be boiled for the same length of time in the same medium.

6. The remains of meals should be thrown in whitewash and removed at the end of each day.

7. Door knobs are liable to be soiled by the hands of one carrying out the excreta and should be carefully watched.

8. In cases of death the body, without being washed, should be wrapped in sheets wet in a solution of bichloride of mercury and should be buried promptly.

Directions for Nurses.—1. Nurses should not hold any direct communication with others while in attendance on the case.

2. They should under no conditions take their meals in the same room with the patient. After touching the patient her hands should be washed in bichloride of mercury one to one thousand.

3. The teeth should be cleansed after each meal, as the mouth affords a peculiar favorable nidus for decomposing matter and would therefore be favorable for the growth of the cholera bacillus.

Treatment.—The successful treatment of cholera depends largely upon how promptly remedial measures are commenced, for if the first sign of relaxation of the bowels is met at once by an energetic astringent and opiate, such as the mixture of a teaspoonful of syrup of galls, ten drops of laudanum, and one drop of chloroform, repeated every hour if necessary, or a compound of ten drops each of tincture of camphor, of capsicum and laudanum, to which, if there is any vomiting, five grains of bismuth should be added, it is certain that many lives might be directly saved by medical treatment. External applications of heat should be made, warm applications to the abdomen will be found grateful to the patient. Sometimes a pill of opium and acetate of lead, with a little capsicum, using, for example, one-half of a grain of opium, two grains of the sugar of lead, and a quarter of a grain of cayenne pepper, is singularly serviceable, and being carried in small compass is especially convenient for travelers.

Pain Treatment.—Should the pain be great control it with one-fourth grain injections of morphine hypodermically. As owing to the profuse discharges the blood is very much concentrated, subcutaneus injections of normal salt solution should be given.

The following well-known cholera or diarrhœa mixture is of great value in the early stages:

Tincture opium	1 ounce
Spirits of camphor	1 “
Tincture capsicum	1 “
Pure chloroform	3 drachms

Alcohol sufficient to make 5 ounces.

Mix and take one teaspoonful every one or two hours.

DIPHTHERIA.

Definition.—An acute infectious disease due to Klebs-Löefler bacillus, characterized by a local fibrinous exudate usually upon the mucous membrane of the throat, with a moderate fever, glandular enlargements and great prostration.

Cause.—The disease is endemic in all large cities, and becomes epidemic at times; while other contagious diseases have diminished in the past decade, diphtheria has increased, particularly in cities.

Contagiousness.—Diphtheria is a highly contagious disease and is readily transmitted from person to person. The bacilli may be received from (1) discharges of diphtheria patients, (2) from the secretions of the nose and throat of convalescence cases, in which the virulent bacilli persists, (3) from the throats of healthy individuals who have acquired the bacilli from being in contact with others having the virulent bacilli on their persons or clothing.

Dangers of the Disease.—No disease of temperate regions proves more fatal to physicians and nurses. There seems to be particular danger in examining and swabbing out the throat; for in the gagging, spluttering and coughing efforts the patient may cough mucus and flakes of membrane into the physician's throat. The bacillus attaches itself to the bedding, clothes and room of the patient with great tenacity.

Attack Upon Children.—Very young children are rarely attacked, the age of predilection being from the second to the fifteenth year. The greatest number of deaths occurs between two and five years of age. Girls are attacked in larger numbers than boys. Adults are frequently affected.

Symptoms.—**Period of incubation is from two to seven days; oftener two** (Tyson).

According to the location we may speak of the pharyngeal, laryngeal and nasal varietes.

1. Pharyngeal.—The symptoms are those of an ordinary febrile attack. Slight chilliness, fever and aching pains in the back and limbs, usually the temperature rises in the first twenty-four hours to 102 degrees to 103 degrees Fahrenheit. There is a slight redness and feeling of soreness in the throat, generally upon one or both tonsils, and on careful examination the tonsils and adjacent portions of the fauces are found to be a little swelled. A whitish-gray patch of false membrane, looking at first like a small ulcer in the mucous surface, next makes its appearance, and this may spread until, by the third day, it has covered the tonsils, fauces and perhaps the uvula.

The False Membrane.—If this false membrane is forcibly torn away, as, for example, by some of the various forceps which were at first invented for the purpose, a raw bleeding surface is exposed, which in a few hours is again covered with a new growth of the layer of membrane. This structure, which is partly composed of an exudation of lymph and partly of a fungoid growth, the micrococcus diphtheriticus, quickly undergoes putrefactive changes, together with the outer layer of mucous membrane lying immediately beneath it, so that there is often a superficial ulceration, from which an unhealthy discharge flows, and a putrid odor frequently emanates constantly, in severe cases of diphtheria.

Thickness of the Membrane.—The thickness and density of the false membrane varies greatly in different cases, and in different epidemics. Sometimes it is scarcely thicker than writing-paper, and has hardly more consistence than thick cream. At other times it is firm and tough, almost like leather, and may even attain the thickness of a quarter of an inch. Although in mild cases and those of moderate severity, its color is grayish-white, in debilitated states of the system, and when there is a tendency to bleeding from the throat and other mucous surfaces, it may be tinged, probably by the altered blood elements of a yellow, yellowish-brown, or dark-brown hue.

Diagnosis.—(*a*) There may be no local manifestation of the membrane, but a simple catarrhal angina, associated sometimes with a croupy cough. The detection in these cases of the Klebs-Löefler bacillus can alone determine the diagnosis.

(*b*) There are cases in which the tonsils are covered with a pultaceous exudate, not a consistent membrane.

(*c*) Cases which begin and often run their entire course with the local picture of a typical lacunar amygdalitis, they may be mild, but in other cases there is a rapid development of membrane and extension of the disease to the pharynx and nose with septic and constitutional symptoms.

2. Nasal Diphtheria.—In membranous or fibrinous rhinitis, a very remarkable affection seen usually in children, the nares are occupied by thick membranes, but there is entire absence of constitutional disturbances. Ravenel collected seventy-seven cases, all of which ran a benign course, and in all but a few the membrane was limited to the nose and the constitutional symptoms were slight or absent. On the other hand nasal diphtheria is apt to present a most malignant type of the disease, high fever, marked glandular evolvement and great prostration by epistaxis and by excoriation of the lips.

3. Laryngeal Diphtheria.—The affection begins like an acute laryngitis, with a slight hoarseness and rough cough, to which the term croupy has been applied. After these symptoms have lasted a day or two, with varying intensity, the child suddenly becomes worse, usually at night, and there are signs of impeded respiration.

Difficulty of Breathing.—At first the difficulty in breathing is paroxysmal, owing probably to a spasm of the muscles of the glottis. Soon the dyspnœa becomes continuous, inspiration and expiration become difficult, particularly the latter. The voice is husky and is reduced to a whisper. The color gradually changes and the imperfect aeration of the blood is shown in the lividity of the lips and finger tips. Restlessness comes on and the child tosses from side to side, vainly trying to get breath. Occasionally in severer paroxysms portions of the membrane are coughed up.

The Fever.—The fever is rarely very high, and the condition of the child at the onset is good. The pulse is always increased in frequency. In favorable cases the dyspnœa is not very urgent, and the color of the face remains good. In unfavorable cases the dyspnœa becomes more and more urgent, the cyanosis deepens, and the child, after a period of restlessness, sinks into a semi-comatose state, and death finally occurs from poisoning of the nerve centres by carbon dioxide.

1. **Complications.**—Hemorrhages from the nose or throat may occur in severe ulcerative cases. Skin rashes are not infrequent. In very bad cases, with extensive sloughing, the septic particles may reach the bronchi and excite gangrenous processes, which may lead to severe and fatal hemorrhages.

2. **Renal Complications.**—These are common, albuminura is present in all severe cases; nephritis may set in quite early in the disease; it sets in at times with complete suppression of the urine.

3. **Paralysis.**—This is rather frequent, occurring in from ten to even twenty per cent. of cases.

Diagnosis.—The onset is more **sudden** than in scarlet fever, the fever higher, the pulse more rapid and the tongue presents a strawberry appearance. For the rest of the diseases it is sufficient to state that, for the purpose of insuring proper sanitary precautions, it is advisable to consider all cases of sore throat, with fever and prostration of strength, in which patches of false membrane, however small, appear upon the tonsils or fauces, as diphtheritic in their character. All cases should be treated as diphtheria until the contrary is proven.

Preventive Measures.—Recent investigations having proved that the poison of diphtheria is portable, communicable by infection, and capable of reproducing itself outside of the human body, diphtheria must now be ranked as both a contagious and infectious disease. The following rules are therefore more imperative than ever before:

1. When a child or young person has a sore throat, a bad odor to its breath, and especially if it has fever, it should immediately be separated and kept secluded from all other persons, except necessary attendants, until it be ascertained whether or not it has diphtheria, or some other communicable disease.

2. Every person known to be sick with diphtheria should be promptly and effectually isolated from the public. Only those persons who are actually necessary should have charge of or visit the patient, and these visitors should be restricted in their intercourse with other individuals. Children residing in a house where there is a case of diphtheria should not be permitted to attend school.

3. When a case of diphtheria is fully developed, the same precautions in regard to free ventilation, disposal and disinfection of discharges, bed or body linen, and so forth, isolation during convalescence (or management of the corpse should death unfortunately occur), and so forth, ought to be enforced which have already been recommended in regard to small-pox and cholera.

4. It is particularly important that persons whose throats are tender or sore from any cause, should avoid possible exposure to the contagion of diphtheria. Children under ten years of age are in much greater danger of taking the disease, and after they do take it of dying from it, than are grown persons. But adults are not exempt, and mild cases in them may cause whole series of fatal attacks among children.

5. Numerous instances are recorded where the contagion of diphtheria has retained its virulence for weeks or months, in cesspools, heaps of decaying vegetable matter, damp walls, and so forth, and been carried for long distances in clothing, in sewers, in waste pipes from stationary washstands, and in other conduits. Hence all sewer connections and other carriers of filth should be well ventilated and disinfected, and children particularly should not be allowed to breathe the air of any water-closet, cesspool, or sewer into which discharges from patients sick with diphtheria have entered, nor to drink water or milk which has been exposed to such air or the atmosphere of the sick-room.

6. Beware of any person who has a sore throat; do not kiss such a person or take his or her breath; do not drink from the same cup, blow the same whistle, nor put his pencil or pen into your mouth.

1. **Treatment.**—Local treatment—germicides and disinfectants are best applied when possible by the spraying apparatus at intervals of an hour, or at most every two hours. If the spray can not be used, as is often the case with children, a soft sponge may be used. The most satisfactory solution for this purpose is equal parts of peroxide of hydrogen and Dobell's solution. Carbolic acid may be used in the proportion of fifteen drops to an ounce of glycerine and water. Boric acid in saturated solution is fairly good. Where there is the laryngeal form the patient should breathe an atmosphere saturated with the vapor of slacked lime.

2. **Constitutional Treatment.**—For checking the growth of the membrane the preparations of mercury are good. The bichloride of mercury in dose of one-forty-eighth to one-twelfth (Tyson) for an adult, in conjunction with the tincture of the chloride of iron and chlorate of potassium every two hours. These doses are given to adults, and they need not be much reduced for children. Quinine should form part of the medical

treatment in doses of from ten to twenty-four grains in twenty-four hours.

Diet.—Stimulating, nourishing and easily assimilated food is necessary. Milk is preferred to all else, fortified with full doses of whiskey, two drachms to an ounce being required in all severe cases. Milk may be alternated with animal broths. When deglutition is difficult nutrient enematas may be given, for this peptonized milk is best.

Opening the Windpipe.—When laryngeal obstruction is imminent intubation or tracheotomy should be performed. Lives have been saved by both these operations. Such cases should breathe air charged with vapor of lime.

3. Serum Treatment.—It has been fully demonstrated that antitoxin or the serum of immunized animals, is the best therapeutic agent in diphtheria. The investigation conducted by the American Pediatric Society has shown that the mortality under the serum treatment in 5,794 cases was only 12.3 per cent. The strength of the serum is measured in units, the latter being equal to 1 c.cm. of "normal serum," which is the blood serum of an immunized animal so active that one-tenth of a c.cm. will antagonize ten times the minimum of diphtheria poison fatal to a guinea pig weighing 300 grams. For children over two years old the initial dose should be from 1,500 to 2,000 units in all severe cases, including those of laryngeal stenosis; this dose to be repeated in from eighteen to twenty-four hours if there is no improvement seen, and again in twenty-four hours if the course of the disease is unfavorable. The third dose is rarely necessary. Mild cases should receive 1,000 units for the first injection, a second is rarely necessary. In cases injected during the first two days the mortality is less than 5 per cent. The question of immunizing those exposed to the disease is a very practical one. It has been carried out on a very large scale in some institutions with satisfactory results. The immunity is only transient and only persists for a few weeks.

WHOOPING-COUGH OR PERTUSSIS.

For full description and treatment of this disease see Part XII, Diseases of Children.

EPIDEMIC PAROTITIS OR MUMPS.

For full description and treatment of this disease see Part XII, Diseases of Children.

INFLUENZA OR LA GRIPPE.

Definition.—An acute infectious disease, appearing at irregular intervals, characterized by extraordinary rapidity of extension and the large number of people attacked.

Causes.—It is caused by the bacillus of Pfeiffer. It spreads with remarkable rapidity. In the large pandemic of 1889-1890 some of the large prisons escaped entirely. The outbreaks of the epidemics are independent of all seasons and meteorological conditions, though the worst epidemics have been in the colder seasons of the year. One attack does not protect. A few persons do not appear liable to the disease.

Symptoms.—Incubation is from one to four days. The onset is usually abrupt, with fever and its associated phenomena. Usually there is coryza and sneezing, with or without watering of the eyes. No age is exempt, as it attacks with impunity the infant as well as the old man. There is generally a cough, to which is added very soon profuse expectorations.

Expectorations.—The cough may be paroxysmal, with prostration at the end of the spell. It often persists, while the bronchitis may pass into broncho-pneumonia, or a croupous-pneumonia may supervene. Another mode of onset is by extreme and sudden prostration. This prostration is apt to be prolonged even in mild cases far beyond what seems reasonable.

Mental Depression.—This is a frequent symptom, and suicide has been its terminal act. There is always more or less fever, ranging from 101 degrees to 106 degrees Fahrenheit. Delirium is nearly always associated with a high fever.

Nausea and Vomiting.—With the onset of the fever there may be nausea and vomiting, or the attack may set in with abdominal pains, profuse diarrhœa and collapse.

Diagnosis.—During a pandemic the cases offer but slight difficulty. The profoundness of the prostration, out of all proportion to intensity of the disease, is one of the most characteristic features.

Treatment.—Isolation should be practiced if possible. Old people should be guarded against all sources of infection. The secretions, nasal and bronchal, should be disinfected. In every case the disease should be regarded as serious and the patient kept in bed until the fever has completely disappeared. From the onset the treatment should be supporting, and the patient should be well fed and nursed. At night ten grains of Dover's powder may be given. At the onset a warm bath is sometimes grateful in relieving the pains in the back and limbs. If there is much fever and delirium small doses of antipyrin may be given and an ice-cap applied to the head. In cases with great cardiac weakness stimulants should be given freely and during convalescence. Strychnia in full doses and good, nutritious diet, cheerful surroundings and change of air are essential. The depression of spirits following this disease is one of its most unpleasant and obstinate features.

GLANDERS OR FARCY.

Definition.—An acute infectious disease, usually commencing with a specific inflammation of the mucous membranes of the nose and throat, and originating in contagion derived from a glandered horse, ass or mule, and characterized by the appearance of vesicles in the mucous membrane of the mouth and between the toes and nodules beneath the skin; in the latter it is called farcy.

Cause.—The disease belongs to the infective granulomata. The local manifestations in the nostrils and skin of the horse are due to one and the same cause. Man becomes infected by contact with diseased animals, and usually by inoculation on an abraded surface of the skin. The contagion may also be received on the mucous membrane.

Symptoms.—The disease has an incubation of from three to five days. At this time there is a febrile movement, with malais and loss of appetite. On the mucous membrane of the lips and tongue and sometimes on the hard palate come vesicles containing a yellowish serum. There is a sensation of heat and burning through the mouth, and the swelling may be so great as to make speech difficult and swallowing painful. There is copious salivation. Almost simultaneously appear vesicles between the fingers and toes and around the nails.

Treatment.—If seen early the wound should be either cut out or thoroughly destroyed by caustics and an antiseptic dressing applied. In the acute cases there is very little hope. In chronic cases recovery is possible, though often tedious.

ANTHRAX OR MALIGNANT PUSTULE.

Definition.—An acute infectious disease of animals, due to the bacillus anthracis, especially affecting cattle and sheep, but transmissible to man.

Causes.—It is very prevalent in Europe and Asia, but is rare in this country. A protective inoculation, with a mitigating virus has been introduced by Pasteur. In animals the disease is conveyed sometimes by direct inoculation, as by the bites and stings of insects, by feeding on the carcasses of animals which have died of the disease, but more commonly by feeding in pastures in which the germs have been preserved. Pasteur believes that the earth worm plays an important part in bringing to the surface and distributing the bacilli which have been propagated in the buried carcass of an infected animal. Certain fields or even farms may thus be infected for an indefinite period of time.

Symptoms.—Anthrax has a period of incubation of about one week, after which there are a number of modes of manifestation of the disease.

1. External Anthrax or Malignant Pustule.—This occurs most frequently on the exposed surfaces, the arms, face or hands, and produces in a few hours a slight redness like that from a mosquito bite, and afterward a little blister. This is soon succeeded by a spreading hardness of the surrounding tissues, which mortify and turn black. Crops of secondary vesicles appear, the neighboring lymphatic glands become inflamed, the breath grows fetid, and there is thirst, high temperature and frequent pulse, and death may take place in from twelve to forty-eight hours, with all the symptoms of profound blood-poisoning. Occasionally recovery takes place, but it is only in mild cases, in which all the symptoms, local and general, are less severe; the vesicles dry up into scabs and the hardness passes away.

2. Malignant Anthrax, Edema.—This form begins in the eyelid, and from thence passes into the head, arms and hands. It is characterized by the absence of the vesicles and by the most extensive edema, which may follow, rather than precede, the constitutional symptoms. The most fatal cases are seen when inoculation takes place about the head and face. A feature in both these forms of malignant pustule, to which many writers refer, is the absence of feelings of distress or anxiety on the part of the patient, whose mental condition may be perfectly clear. He may be without apprehension, even though his condition is very critical.

Diagnosis.—Diagnosis can be readily made from the character of the lesion and the occupation of the patient. When in doubt a microscopical examination of the fluid from the pustule may show the presence of the bacillus.

3. Intestinal Form.—In these cases the infection is usually through the stomach and intestines and results from eating the flesh or drinking the milk of diseased animals. It may, however, follow an external infection if the germs are carried to the mouth. In acute cases there are dyspnœa, cyanosis, great anxiety and restlessness, and toward the end convulsions or spasms of the muscles.

4. **Wool Sorters' Disease.**—This important form of anthrax is found in large establishments in which wool or hair is sorted and cleansed. The hair and wool imported into Europe from Russia and South America appear to have induced the largest number of cases. Many of these show no external lesion. The infected material being swallowed or inhaled with the dust.

Symptoms.—There are rarely any preliminary symptoms. The patient is seized with a chill, becomes faint and prostrated, has pains in the back and legs and the temperature rises to 102 degrees or 103 degrees Fahrenheit. The breathing is rapid, and there is much pain in the chest. There may be a cough and signs of bronchitis. There may be vomiting, and death may occur within twenty-four hours. In more protracted cases there may be diarrhœa, delirium and unconsciousness.

Treatment.—In malignant pustule, the site of inoculation should be destroyed by the caustic or hot iron and a little powdered bichloride of mercury sprinkled over the exposed surface. The local development of the bacilli about the site of inoculation may be prevented by the subcutaneous injections of carbolic acid or bichloride of mercury. The injections should be made at various points around the pustule, and may be repeated two or three times a day.

Internal Treatment.—The internal treatment should be confined to the administration of stimulants and plenty of nutritious food. Davies-Colley advises ipecacuanha powder in doses of five to ten grains every three or four hours. In the malignant form, particularly the intestinal variety, little can be done. Keep the bowels active.

ERYSIPELAS OR ST. ANTHONY'S FIRE.

Definition.—This is a specific, contagious inflammation of the skin, tending to spread over large portions of the cutaneous surface with the usual signs of inflammation—pain, heat, redness and swelling.

Causes.—This complaint has, as a rule, for its starting point some slight wound or abrasion of the skin, although occasionally it seems to arise spontaneously, affecting the head and face in such instances more frequently than any other portion of the body. It is particularly prevalent in the spring of the year. It can be conveyed by a third person. The poison certainly attaches itself to clothing, furniture and bed-room walls. Recently delivered women and persons who have been the subjects of surgical operations are particularly susceptible to it.

Predisposing Causes.—Predisposing causes are Bright's disease, alcoholism and debility. The specific agent of the disease is a streptococcus growing in long chains, the streptococcus erysipelatous.

Symptoms.—Period of incubation is variable from one to eight days. The stage of invasions is often marked with a rigor and followed by a rapid rise in temperature and other signs of an acute fever, when there is a local abrasion, the spot is slightly reddened, but if the disease is idiopathic there is seen within a few hours a slight redness over the bridge of the nose and on the cheeks. The swelling and tension of the skin increase and within twenty-four hours the external symptoms are well marked.

The Skin.—The skin is smooth, tense and edematous. It looks red, feels hot and the superficial layers of the skin may be lifted as small blebs. The swelling increases rapidly, and during the second day the eyes are usually closed.

Further Symptoms.—The first affected parts gradually become pale and less swollen as the disease extends. When it reaches the forehead it progresses as an advancing ridge, perfectly well defined and raised; and often on palpation hardened extensions can be felt beneath the skin, which is not yet reddened. Even in cases of moderate severity the face is enormously swollen, the eyes closed and the lips edematous, the ears thickened, the scalp is swollen and the patient's features quite unrecognizable.

Blood Poisoning.—The lymphatic vessels and glands, especially the cervical, are almost always more or less affected, and poisoning of the blood as in pyemia not infrequently occurs. One attack of the disease, so far from affording any protection, generally leaves the patient particularly susceptible to the malady for a long time, perhaps for life. Delirium is present, the tongue becomes dry, the pulse feeble and there is marked tendency to death from toxema. In the majority of cases, however, even with extensive lesions the constitutional disturbances, considering the height of the fever range, is slight.

Treatment.—Isolation must be carried out. A practitioner in attendance on a case of this disease should not attend a woman in confinement. The disease is self limited and a large majority of cases get well without any internal medication.

Diet.—The diet should be nutritious and light. Stimulants are not required, except in the old and feeble. For sleeplessness, restlessness and delirium chloral and the bromides may be given, or if these fail, opium; when the fever is high the patient may be bathed or sponged. Of the internal remedies the tincture of the perchloride of iron has been highly recommended.

Local Treatment.—For the local treatment, two per cent. solutions of carbolic acid, the corrosive sublimate solution 1 to 2,000. In the Polyclinic Hospital in Philadelphia the application of ichthyol ointment over the reddened area, and should there be a wound, washing it out with normal salt solution have proved very efficacious.

SEPTICEMIA OR BLOOD POISON.

Definition.—It is a condition in which, with or without a local site of infection, there is a microbic invasion of the blood and tissues, but in which there are no foci of suppuration.

Symptoms.—Illustrative cases of the more usual form of septicemia are puerperal fever, following a retained placenta, infection by scarlet fever, or difficult labor involving lacerations and the poisoning by a dissecting wound. The symptoms set in from three hours to four days, usually twenty-four hours.

Initial Symptoms.—The usual initial symptom is a chill varying in severity; it may, however, be preceded by a headache and malaise and is always followed by a high fever. In bad cases the chill is repeated daily and the temperature rises high. I have known of one instance in which it went to 106.7 degrees Fahrenheit. The patient is restless, the tongue at first red and glazed becomes dry and leathery, the pulse at first full and bounding becomes weak and compressible with a rate of 130 or more. Prostration is marked.

The Fever.—The fever is subject to remissions which give rise to the inexperienced to delusive hope. The chill is followed by profuse sweating and further prostration, the mind early begins to wander and delirium of the low muttering kind is soon established. There is a tenderness over the abdomen in puerperal cases and in all a tendency to enlargement of the spleen with hypostatic congestion of the lungs and often bronchopneumonia will result.

Diagnosis.—This is usually easy, the resemblance of the more serious form to intermittent fever has been referred to. In this disease the remissions are not so total and the patient remains very ill.

Treatment.—In treatment all possible infecting foci should be removed by surgical methods; after this the strength should be supported by quinine, strychnine and stimulants. The food should be liquid and of the most nourishing kind. The fever should be reduced with cold sponging.

PYEMIA OR PUS BLOOD POISON.

Definition.—Pyemia is a general febrile affection due to sepsis, characterized by recurring chills and profuse sweats with remissions or intermissions in the fever, also by abscesses variously disseminated in the different tissues and organs of the body.

Causes.—The same essential cause lies at the bottom of pyemia as of septicemia, but associated with this disease are the important etiological factors, thrombosis and embolism. Fragments of a venous thrombus due to a phlebitis at the seat of putrid inflammation are broken off and carried in the circulation until a lodgment is effected. These fragments swarm with bacteria and the embolus excites intense inflammation, which goes on to abscess formation. The emboli may be multiple, and there will be as many abscesses as there are emboli. The seats of election are lungs, liver, spleen, kidneys, brain and joints and the various connective tissues in the order above given.

Other Causes.—Other causes are gunshot injuries of bone and compound fractures, gonorrhea and prostatic abscesses.

Symptoms.—A rapidly rising fever, often so closely followed by a chill, that its previous existence is often not suspected. The severity of the chill is proportionate to the intensity of the infection. The temperature during the chill reaches 103 degrees to 105 degrees Fahrenheit, and is followed by a sweat and fall in temperature, after which the latter rises again to a point even higher than was at first attained. The temperature may rise and fall several times, but as a rule each one goes higher than the preceding one.

Other Symptoms.—The other symptoms of fever are also present, thirst, loss of appetite and nausea. The strength of the patient rapidly wanes and he soon sinks into a condition of exhaustion and semi-consciousness from which he may be aroused to take medicine and nourishment.

Diagnosis is not usually difficult, a careful study of the case will show marked differences in history to typhoid fever and malarial fever. There are no rigors followed by sweats in typhoid, and finding the plasmodium malariæ in the blood of suspected patient will settle the case should it be malaria.

Treatment is like that of septicemia. Remove the foci of infection surgically, and after that the symptoms are to be combated and the strength supported to the utmost.

CURATIVE MEDICINE.

PART II.

THE CONSTITUTIONAL DISEASES.

Meaning of Constitutional Diseases.—By constitutional or organic disease is generally meant a visible disorder of structure; that disease and disorder are, however, essentially the same thing, is clear from the circumstance that function and organism are united. The state of the organ will always influence the function, just as a power applied to any machinery will produce effects according to the nature of the machine and the materials acted upon. The power and function of the machine are dependent on its intrinsic mechanism, though set to work by an extrinsic influence. The mode of working is not visible in the vital organs, nor are the functions of life mechanical, except so far as they act in time and space.

ACUTE RHEUMATISM OR RHEUMATIC FEVER.

Symptoms.—Acute rheumatism is an inflammation of the joints, characterized by general fever, by pain, heat, redness and swelling of the joints affected, and by a tendency to leave one joint suddenly and fasten upon another. The affection sometimes commences by chills and fever, and general uneasiness; and these symptoms (rheumatic fever) may last for twenty-four hours or more before the local manifestations show themselves. More frequently the local symptoms make their appearance at the same time with the fever, and occasionally they are present some little time before it supervenes.

The Pain.—The pain in the joint or joints affected, commonly but little felt while the patient is perfectly quiet, becomes intense on the slightest motion, so that he is rendered completely helpless. The superficial joints become swollen and tense, they are hotter than natural, and the skin covering them is generally more or less reddened.

The Swelling.—The swelling is sometimes mainly caused by effusion within the capsular ligament of the joint itself, at others by the inflammation and thickening of the fibrous tissues external to the joint. The pulse is generally full, strong and moderately frequent, rarely rising over 100 beats in a minute; the skin is warm and copious sour perspirations are commonly present; the tongue is thickly coated, the bowels somewhat constipated and the appetite completely lost.

Freaks of Inflammation.—The inflammation at first affects one or two joints, rarely three; after a variable time it commonly leaves the joints first affected as suddenly as it attacked them, and fastens on some other articulation; often, however, new joints are attacked without the disease leaving its original seat. As a rule the larger joints are the ones most liable to be attacked, the knees, elbows, ankles, wrists and hips; more rarely the smaller joints of the toes and fingers become affected.

Heart Attack.—Besides the articulations, acute rheumatism frequently attacks the heart, not by metastasis or transference of the inflammation from one part to another, but by seizing on the fibrous textures of the heart as in one of the series of textures liable to the disease. Sometimes the pericardium is attacked (pericarditis), sometimes the lining membrane of the heart's cavities (endocarditis). The younger the patient the more liable is the heart to be affected; so that when rheumatism occurs previous to the adult age the heart is attacked in a large majority of cases.

Rheumatism Hereditary.—The rheumatic constitution is frequently hereditary, and rheumatism is peculiarly a complaint of cold, damp seasons and climates.

Causes.—The cause of rheumatism has provoked more thought and research than any of the commoner diseases; at least one type of the disease is due to excess of fibrin in the blood. There is an exudation of this fibrinous material into the sheaths of nerves about tendons, especially where inserted into the bone, the fasciæ of muscles, the serous capsules of organs, their ligamentous attachments, in joints, heart valves, and so forth, wherever fibrous tissue is found normally. This fibrinous exudate organizes into bands, fungus, nodules, and so forth, of cicatricial tissue, obstructing circulation and movement of parts and modifying cell nutrition. The presence of this fibrinous exudate makes the muscles hard and stiff, so that they contract with difficulty and pain, yet appear large and strong. Impinging upon nerves it causes pain and perverted nerve action. Especially is this the case where the deposit occurs near the bony opening whence the nerves emerge.

The Fibrous Exudation.—This fibrinous exudate is precisely like the membrane of diphtheria, of membranous dysmenorrhea, colitis and croup, the exudate in lobar pneumonia, and so forth. Its appearance in the muscles and other structures is also preceded by a similar weakening of the vaso-motor nerves. When the blood gets into this hyperplastic state it must get rid of the excess of fibrin-forming materials in some way, or it would finally solidify, organize like a clot, and the individual turn to stone. So nature sounds the alarm, and sacrifices a part to save the organism. But sometimes her warnings are not heeded.

A Chief Cause.—The chief exciting cause, we know, is the application of cold to the body when unusually heated. Cold is more liable to produce this effect when combined with moisture, whence a cold and humid atmosphere and wet or damp clothes are the most frequent sources to which rheumatism can be traced. Partial cold, as when parts of the body are subjected to currents of cold air, is very apt to give rise to rheumatism; when the body is predisposed a very transitory exposure of this kind will suffice to bring on an attack; if the current be sustained for any time, few will wholly escape some contingent suffering. Of the fact that rheumatism is so excited there can be no doubt. When it is reflected, however, that for every instance of rheumatism so induced, numbers continually endure as much or greater exposure to the alleged cause without any disease ensuing, too much importance should not be attached to it.

Diagnosis.—The only disease with which it is liable to be confounded is gout. Formerly discrimination in this respect was deemed of high importance, the prevailing theories of gout demanding a course of treatment very different from that to which rheumatism was subjected. In the present day a juster pathology of gout assimilates the treatment of both diseases sufficiently to render extreme accuracy of discrimination of very slight moment.

Prognosis.—The prognosis is dependent on the promptitude with which suitable treatment is resorted to. Generally speaking there is little immediate danger to life, there being no inflammatory disease of equal intensity which so little deranges the vital functions. This, most probably, is owing to the disease expending its violence in the joints and other external parts, and being little prone to attack the viscera. The peculiar character of the inflammatory action, too, and the little liability which it has to pass into suppuration, or undergo the other changes consequent to phlegmonous inflammation, may account for the safety with which even the metastasis of rheumatism to internal parts is borne. It is certain that such metastasis is not attended with so much danger as the severity of the symptoms would seem to denote.

Management of Acute Rheumatism.—One of the most important points in the management of acute rheumatism is to watch the supervention of the morbid action in the fibro-serous tissues of the heart. It is not necessary to repeat here the symptoms of pericarditis and endocarditis, but the occurrence of dyspnœa, with more or less anxiety, jerking or feeble and rapid pulse and tumultuous action of the heart ought to direct the attention of the practitioner to that viscus, and if he discovers by the physical signs and functional phenomena the existence of inflammatory action there, it must be treated as if the disease were unconnected with rheumatism, for no truth is better established than that, although acute rheumatism, seated in the fibrous and muscular tissues around the joints, is remarkable for its great and rapid change of location; chronic rheumatism loses this mobility when it fixes upon a serous membrane.

Treatment 1.—Acute rheumatism produces, we have seen, diseases of the heart; it is, therefore, incumbent on the practitioner to prevent the continuance of the rheumatic inflammation of the serous membrane of the heart. The indications are to subdue fever and remove inflammation. The promptitude with which the local inflammation in its earliest stage yields to the treatment by which a plethoric state of constitution is corrected, and febrile action allayed, and the obstinacy of the local ailments, whenever the constitutional state is overlooked or inadequately treated, furnish the best proofs of the correctness of this pathology.

2. The treatment has been pursued in various ways—bleeding, mercurials, mercurials with purgatives, opium, sulphate of quinine and nitrate of potassa in large doses have been at various times resorted to. Of these methods, those by large doses of sulphate of quinine and by nitrate of potassa have seemed to have an influence in controlling and cutting short the disease, and the treatment by quinine appears to be successful in the acutest and most violent attacks; but they are both subject to inconvenience and dangers which counterbalance their advantages.

3. The treatment which is most generally relied on is the alkaline. Our aim being to liquefy and eliminate the fibrinous deposit. The iodides, ammonia preparations, jaborandi, hot vapor baths, massage, and counter-irritation have all been employed; overfeeding, especially with meats and highly concentrated foods, should be rigorously avoided. Persons having this fibrous diathesis should employ a resolvent treatment at intervals, for weeks at a time. Exercise must be systematic, and too much cannot be said of the value of hot vapor baths, massage and joint movements.

4. If the heart shows signs of being affected, and embolism or phlebitis occur, use ammonia, carbonate and acetate with nitro-glycerine, warmth to and rubbing of extremities with mercury to move the bowels. The old custom of venesection, and cups, in vigorous subjects, was very fair

practice. It made the patient thirsty and so called for diluents to thin the viscid blood. The cups relieved engorged parts, and paved the way for a better circulation through them.

5. The fibrous diathesis varies from that of the uric acid, and the same treatment will not always relieve the rheumatic pains of both. In the former, there is a tendency to congestion of the brain, the liver and kidneys are apt to be sluggish. In the uric acid type of rheumatism irritability is contrasted with the torpor which characterizes the fibrous. Enlarged joints are common, and storms of disease sweep over the system. Muscular development is slight, and the powers of endurance small. In the fibrous diathesis the patient is well developed, tough and resisting.

As rheumatism is invariably accompanied by loss of appetite and embarrassed metabolism, it is naturally the result of accumulated secretions and imperfect excretion, hence it is best treated by freeing the bodily outlets and carefully measuring the supplies. While recognizing the necessity of salicylate treatment, we would advise that such be combined with mild cholagogues, diaphoretics and diuretics. The salicylate appears to exert a general action on all the excretions in the exact proportion in which such is needed.

6. If any organ requires but little correction, it receives no more, and on that account sufficient force is retained to exercise itself where it is more in demand. As a result, the beneficial effects of the salicylic acid treatment are utilized to its fullest extent without being followed by bad reactionary conditions.

MUSCULAR RHEUMATISM.

Of the minor painful maladies this is, perhaps, the most common in many parts of the country. It may attack any muscle, but its three most decided and painful phases are lumbago, stiff neck and pain in the side (pleurodynia), all of which yield to the same or analogous treatments.

Lumbago.—This affects the large muscles of the back and loins, sometimes extending to the lowest parts of the spine. The pain is severe and often of sudden occurrence, very much as if one had sprained his back.

Treatment.—Apply locally chloroform liniment on hot flannel. A porous plaster is often effective. Assume and hold a restful position. Take internally two grains each of quinine and phenacetin, with one twelfth of a grain of belladonna every three hours until relieved.

Stiff Neck.—This is also called cervical rheumatism. It affects the large muscle at the side of the head behind the ear, extending down to the collar or even the breast bone.

Treatment.—Apply locally chloroform liniment on hot flannel. Assume and keep a restful position. Take internally two grains each of quinine and phenatecin, with one-twelfth of a grain of belladonna every three hours until relieved.

Pain in the Side (Pleurodynia) arises from a rheumatic affection of the muscles concerned in breathing, especially the short, flat muscles between the ribs, called intercostal muscles. It is also called intercostal rheumatism. The pain produced resembles that of pleurisy, and sometimes excites alarm lest some more serious disease is present. A test of the lungs with the stethoscope will determine whether the condition is pleuritic or not. Absence of cough or fever, and soreness, upon touch, of the muscles on the side affected, also show that pleurisy is not present.

Treatment 1.—As in all cases of muscular rheumatism, put the affected muscles at rest as far as possible. Of course this will be hard to do, because these muscles are engaged as helps in respiration, but the object may be aided by applying strips of adhesive plaster, overlapping each other, around the affected side, so as to compress it tightly.

2. Apply an ordinary porous plaster to the side affected.

3. Treat internally by taking every three hours, until relieved, a dose consisting of two grains each of quinine and phenacetin, with two grains of Dover's powder.

4. Fifteen drops of wine of colchicum, with a quarter of a grain of opium, used in very small but often repeated doses, is often beneficial in all the above forms of muscular rheumatism.

5. In all of the above forms of muscular rheumatism—lumbago, stiff neck and pleurodynia—where the suffering is intense, a hypodermic injection of a quarter of grain of morphia will afford prompt relief.

CHRONIC RHEUMATISM.

Character.—The distinctive characters of this malady are a febrile state of the general system, with more or less pain and swelling in certain tissues and joints. And in this, precisely as in acute rheumatism, the continuance of febrile action undermines the general health, while the local inflammation, however indolent, disorganizes the joints, occasioning eventual decrepitude. The pain and swelling of joints with progressive thickening of the ligaments and effusion in the several bursæ sufficiently evince the morbid actions from which such effects result. But coincident with these will generally be found a quickened pulse, some increased heat of skin and a furred tongue.

Symptoms.—Chronic rheumatism presents itself under two forms. In one the joints are swollen and painful, the pain being aggravated by motion; there is no general fever and the appetite may be good and the digestion sound. The affection is exceedingly obstinate, attacking new joints without leaving those first affected; it frequently attacks the smaller joints, rendering them permanently swollen and deformed, while the immobility to which the joints are sometimes reduced may cause atrophy of the muscles connected with them.

Gout.—When the type is precise and definite it presents sharply-drawn distinctive characters which distinguish it from gout; but it must be admitted that there are many cases in which it exhibits so great a resemblance to chronic gout that it is almost impossible to establish an absolute distinction between the two diseases. Mobility is the primordial character of rheumatism; this character at once presents itself. In gout—on the other hand—mobility does not show itself until the malady has become inveterate, until the attacks, which at first were strictly local, have frequently recurred, or the progress of the regular manifestations has been interfered with.

Treatment 1.—In the treatment alkalies and diuretics are of service, also the iodide of potassa, while the different mineral waters are frequently of great service. Warm salt water baths, the use of flannel and stimulating liniments afford relief.

2. It would be vain to enumerate the various stimulants which have obtained character for the cure or relief of this disease. The principal are the different essential oils; various balsams and gum resins; sudorific decoctions; electricity. Any of these may benefit according as the general constitution is prepared for their operation, or as the special ailment may require. If there be no plethoric or febrile state present, their use will at least be harmless, if not beneficial; but should the case be such as to need depletory treatment and the operation of mercury, then must the use of such stimulants as are now named be watched with great caution. Warm bathing and active exercise are among the unexceptionable and most powerful means of relieving chronic rheumatism.

Local Treatment 1.—The local treatment as directed for the regular or acute rheumatism also requires to be assiduously employed. For this various liniments are useful; none are better than those containing oil of turpentine, oil of sassafras, ammonia and laudanum, diluted with soap liniment, or where pain is considerable, chloroform or aconite liniment. Blisters may be applied in obstinate cases. Dry cupping to the back, leaving a number of cups on for twenty or thirty minutes at a time makes a more pervading favorable impression sometimes than might have been expected.

2. For rigidity of the joints and even for pain in them or in the muscles, pouring hot water continuously over the parts does great service. The hot bath or vapor bath, or, as some perfer, the hot dry-air bath (130 degrees to 200 degrees) will be powerful for relief in many cases.

Electric Treatment.—Electricity also will aid in hastening the restoration of use to the stiffened parts.

SYPHILITIC RHEUMATISM.

This affects the long and flat bones chiefly, and mostly between the joints, not at them. Generally there is nodosity upon the bones affected, or some degree of periosteal inflammation at least. Our main reliance in this affection is the iodide of potassium.

ARTHRITIC RHEUMATISM.

This designation is applied to a form of subacute or chronic inflammation of one or more large joints of greater severity than ordinary chronic rheumatism. Effusion into the joints, with deformity and permanent lameness may occur. The treatment pursued in chronic rheumatism has proved beneficial.

GONORRHEAL RHEUMATISM.

A peculiar inflammation of one or more joints occasionally commencing in the course of gonorrhea or even of urethral inflammation from forced catheterism. The local affection may be severe, with suppuration in a few cases and anchylosis of the joint in many. It appears to be an ichoræmic affection; the result of absorption into the blood of morbid matter effused into the membrane of the urethra.

CANCER, OR MALIGNANT DISEASE.

Common Form of Cancer.—The most familiar and characteristic form of cancer is that which attacks the female breast, usually past the middle period of life. It first appears as a local induration situated beneath the skin, in the glandular tissue of the organ, for the most part in the neighborhood of the nipple. It increases slowly in size, becomes adherent to the skin and involves more and more of the substance of the breast.

Cancer Pains.—In most cases sharp lancinating pains are experienced at this time, sometimes causing much distress. When the glandular substance of the breast has become fully affected, it is also found to be adherent to the walls of the chest, so that it can no longer be moved from side to side, and the skin over its whole surface is discolored. Smooth in texture, raised in irregular knobs or eminences and in spots red and tender.

The Ulceration.—The early hardness now yields to local softening, the skin gives way at some prominent point, and the ulcer thus formed shows no tendency to heal, but constantly enlarges and discharges a dark-colored and fetid exudation. Subsequently the morbid growth involves the subjacent muscles, the ribs and even the substance of the lungs. Internal cancer, however, is often developed as a secondary affection without being directly continuous with the external growth. The patient may be gradually exhausted by the pain, discharge and constitutional irritation dependent upon external cancer alone, or the fatal termination may be principally due to the secondary affection of the internal organs.

Course of Cancer.—The course of cancer is for the most part slow, requiring several years to pass through its successive stages. This is generally the case in cancer of the breast. In other forms, particularly where the morbid growth is softer and more vascular at the outset it often terminates fatally in a few months or even weeks.

Train of Cancerous Symptoms.—The cancerous humor possesses these characteristics:

1. The peculiar power of infiltrating every tissue as it encroaches upon it.

2. It spreads to the lymphatic glands of the neighborhood through the absorbents.

3. It affects the body generally through the vascular system, thus giving rise to secondary deposits, that is to say, to the development of similar growths in the viscera or remote parts, the lungs and liver being particularly prone to its attack.

4. It is liable to recur after removal.

The stroma is abundant, tough and resisting, giving a tuberoid circumscribed appearance to the mass when superficial. It is of great hardness, and when fully developed is firmly adherent to the adjacent parts. Upon section it presents a bluish-white, glistening appearance and yields a creamy, oily fluid known as cancer juice. When situated subcutaneously, as in the mamma, the tumor commonly assumes a dark purple or livid color, and is subject to darting, stinging or neuralgic pains. It is apt to ulcerate, when the sore will present hard and everted edges and the neighboring lymphatics will become indurated and enlarged. It is found most frequently in the mamma, liver, stomach and rectum. It is more frequent in women than in men. It is of slow growth, and rarely occurs before forty or forty-five years of age.

Causes.—The observations which we have made on the relative frequency of cancer as to age, sex-temperament and condition of life contain the greatest part of what we have to say on the predisposing causes of the disease. Among these have long been enumerated the frequent and direct operation of irritating substances; external injuries, especially blows; the abuse of stimulating potions; immoderate indulgence in venery; the depressing influence of moral afflictions; bad food, conjoined with the debilitating effects of cold and otherwise unhealthy habitations; the injurious influence of one or more of these predisposing causes on particular organs being determined or modified by the individual or accidental circumstances of the case.

Cancer may be Hereditary.—The frequent occurrence, however, of cancer in individuals in whom none of these predisposing causes seem to have coöperated in the production of the disease has led many pathologists to consider it as having an hereditary origin.

Transmission of Cancer Germ.—The germ of the disease, or cancerous virus, is transmitted from the parent to his offspring. The evidence on which this opinion rests is shown in the fact that the material element of the disease is contained in the blood, and is separated from this fluid after the manner of nutrition and secretion, either in the molecular structure or on the free surface of organs; and that, while the formation of the disease is thus going on, there may be no appreciable physical or physiological modification of the part in which it is observed. It is thus that we meet with carcinomatous tumors in the brain, which, from their bulk and other characters, must have existed long before the functional disturbance of the organ gave signs of their presence; and we have an equally striking example of the silent development of these tumors in the eye, until acting simply as a foreign body, they obstruct the rays of light and render vision more or less imperfect.

Cancer Pimple.—In persons, too, apparently in the enjoyment of the most perfect health, we often see the disease making its appearance in the form of a small pimple, proceeding more or less rapidly in its course, extending in breadth and depth and terminating ultimately in death, in spite of all the means which art has devised. In others, a similar pimple arises under similar or even unfavorable circumstances, proceeds like the former to ulceration, and although it may have been neglected, irritated and excited from time to time, disappears and leaves the patient in perfect health.

Diagnosis.—It is not until carcinoma has made some progress that we are sometimes able to recognize its presence in internal organs by means of a careful consideration of the local and general symptoms which we have enumerated. Little importance in general is to be attached to any one of them taken individually. But when the local signs, viz., the changes in the bulk, form and situation of organs, occasioned by the disease, its relative frequency in different organs and in particular portions of the same organ are taken in connection with the special and general modification of function which may be present in individual cases, the greatest possible assistance is afforded us in establishing the diagnosis. Thus it is more easy to detect cancer of the stomach than of the lungs, of the latter than of the brain; because of our being able to ascertain the presence of the greater number of the local signs of the disease in the first case, only a few of them in the second and none at all in the third.

Further Diagnosis.—And when the sense of sight can be applied with that of touch and hearing the diagnosis seldom presents much difficulty, as in the case of carcinoma of the os uteri and rectum. It is necessary to observe that too much reliance is not to be placed on the presence of these general symptoms which constitute the cancerous cachexia, for there are morbid conditions of the stomach and duodenum associated with the derangements of the biliary secretion which give rise to a state of debility and emaciation, accompanied with discoloration of the skin, which so closely resembles this cachexia that the one is not to be distinguished from the other.

Difficulty of Diagnosis.—The difficulty of establishing the diagnosis in such cases is likewise increased by the circumstance that the same chronic character prevails in both. It is hardly necessary to remark that the presence of carcinoma in an external part of the body is to be regarded as a diagnostic sign of great importance in all cases of a doubtful character in which functional derangement of an internal organ has existed for some time. In such a case we should regard the frequent occurrence of vomiting after meals as indicating the existence of carcinoma of the pylorus, even should no tumor be felt in this situation or dilatation of the stomach.

Abdominal Tumor.—If the presence of a tumor were detected in any part of the abdominal cavity we should not hesitate to say that it was of the same nature as the external affection, and the occurrence of paralysis, under the same circumstances, would justify us in attributing it to carcinoma of the brain or spinal cord.

Possibility of Cure.—In no disease is a fatal determination so universally admitted as in carcinoma. The possibility of the cure of cancer of the internal organs has never been supported by substantial evidence, and the examples are few indeed in which we are disposed to believe that the disease has been removed from an external part by surgical or other means, without its recurrence in the same or some other part of the body at some other future period.

Symptoms.—Changes in the color, temperature, circulation and nutrition of the affected organ cannot be detected by direct observation, and those of bulk consistence and form can be determined only in certain organs, and at a more or less advanced period of the disease, such as the stomach and intestines, liver, spleen, kidneys, ovaries and uterus, lungs and mesenteric glands, in all of which organs these changes may be recognized either by the touch, percussion or auscultation. But it is more particularly the change of bulk which is detected by these means, and which, as a local symptom of the presence of cancer, is that to which the greatest importance is to be attached. The increase of bulk which accompanies the presence of cancer is not perceptible until the disease has made some progress. It is most considerable in solid organs, such as the liver, kidney, ovaries and so forth, and is seldom very marked in hollow organs, such as the stomach or intestines.

Further Symptoms.—Considerable increase of bulk may, however, have taken place in the walls of the stomach and intestines without our being able to detect its presence, which happens when cancerous matter accumulates in the direction of the internal surface of these organs. In such cases an increase of bulk of a different kind is produced, viz., dilatation, in consequence of the obstacle presented by the carcinomatous matter to the passage of the food or feces. When dilatation of the stomach is thus produced, the obstacle is situated at the pylorus; when of the small intestines, it is, in the great majority of cases, situated at the termination of the duodenum or commencement of the jejunum and caput cecum coli; and at the sigmoid flexure of the colon and rectum when the dilatation occupies the larger intestines.

Bulk of Stomach.—The increase of bulk which the stomach and intestines acquire in consequence of an obstacle of this kind is sometimes very great. In some cases of scirrhus pylorus the stomach has been found to occupy the greater part of the abdominal cavity, stretching down to the symphysis of the pubis and from one lumbar region to another; and the large intestines sometimes measure from four to six inches in diameter when similarly affected. We have seen the small intestines equal in size to the ordinary dimensions of the stomach. It is important to know that the extent of the dilatation is not to be taken as the measure of the extent of the disease. The greater the dilatation the greater we may infer is the obstacle by which it is occasioned, but this obstacle may consist in a slight scirrhus enlargement, which prevents the passage of the food or feces as effectually as when it is occasioned by one or more tumors of considerable size or great thickening occupying several inches in length of the whole circumference of the walls of the stomach and intestines.

Pain of Cancer.—The only modification of the sensibility which as a local symptom accompanies cancer is that of pain. There is, however, no symptom of carcinoma more deceptive than pain. Of all varieties of carcinoma it is that of scirrhus which is most frequently accompanied with pain, and it is also in this variety that the pain is most severe, acute and lancinating. Vomiting is an invariable consequence of carcinoma of the pylorus, accompanied with a diminution of bulk of the orifice of this part sufficient to interrupt or impede the exit of the chyme or indigested food.

Vomiting in Cancer.—Perhaps the most frequent cause of vomiting is the mechanical obstacle occasioned by the carcinomatous substance in the pyloric portion of the stomach. The quantity and quality of the matters vomited are variable. Both will be modified by the quantity and quality of the food and drink; the former by the capacity of the stomach and the absence or presence of irritation; the latter by the nature of the ingesta, the state of digestion and the stage and variety of the disease. It is only at the early stage of carcinoma, or at least before softening and ulceration have taken place, that the vomiting consists of a watery or mucous secretion. In the great majority of cases, and always toward the termination of the disease, the contents of the stomach ejected by vomiting contain a substance resembling the lees of wine, a mixture of chocolate or soot and water. The substance may appear in the form of little particles, patches or streaks, and indicates the effusion of the blood into the cavity of the stomach from hemorrhage, either in consequence of the softening of the carcinomatous matter or the sloughing of this substance and of the contiguous parts.

Cancer of Liver.—Carcinoma of the liver may occur without any appreciable derangement of the special function of the organ being observed. There is often no apparent alteration in the quantity or quality of the bile, even in the most extensive forms of cancer of the liver.

Cancer of Kidney.—There is no apparent modification of the secretion of urine in cancer of one of the kidneys, although the disease may be so extensive as to leave no trace of the natural structure of the organ.

Cancer of Uterus.—The much more frequent occurrence of cancer after than before the cessation of the menstural discharge, prevents us from estimating accurately the influence which this disease exercises on the special function of the uterus and ovaries. Impregnation, however, has been known to have taken place in carcinoma of the os uteri, and of one of the ovaries.

Cancer of Spleen.—As regards the spleen its cellular organization may be completely effaced by the presence of the carcinomatous matter, and consequently it is rendered incapable of receiving more blood than is necessary for the nutrition of its solid parts and the growth of the disease.

Cancer of Duodenum.—Cancer of the duodenal extremity of the pancreas, in consequence of the compression of the duct which passes in this direction, gives rise to an accumulation of the secretion of this organ, and great dilatation of the duct throughout its whole extent. Diminished or suspended absorption are the occasional consequences of cancer of the mesenteric and lymphatic glands.

Cancer of Brain.—The functional lesions which accompany cancer of the brain, cerebellum and spinal cord vary considerably with the seat of the disease relative to these organs individually, as well as to particular portions of them. But in neither of these respects does it give rise to any symptoms which can be regarded as pathognomonic of its presence. As a foreign body it gives rise sometimes to a degree of compression sufficient to produce partial or complete paralysis, loss of memory or difficulty of speech and derangement of the intellectual faculties.

Symptoms.—But these latter changes depend principally on the irritation and softening of the substance of the brain in contact with the carcinomatous mass. Even paralysis is more frequently produced by these subsequent changes than by compression.

The Spinal Cord.—Paralysis of the superior and inferior extremities of the muscles of respiration, and of the bladder and rectum take place in carcinoma of the spinal cord, the seat and extent of the paralysis depending on the portion of the spinal cord occupied by the disease.

General Symptoms.—The general symptoms of carcinoma do not make their appearance before the last stage of the disease. Their severity depends much on the nature of the organ and the extent to which it is affected, but it is principally the irritation produced by the presence of the cancerous substance during the period of softening, sloughing and ulceration that determines the gravity of these symptoms. It is in this, the last stage of the disease, that the circulation and innervation become deranged, and that fever and a diminution of the nutritive function are first observed. It is likewise at this period, but more frequently a few days or weeks before death, that the skin assumes a pale earthy or dull ochery tint; the debility and emaciation make rapid progress, and all the functions of the economy become implicated in the deteriorating influence of the disease. It is this group of the general symptoms which constitute what is called the cancerous cachexia.

Fever Symptoms.—The febrile symptoms, as well as the diminution of nutrition in general, are greatest when the seat of cancer is the uterus or stomach, and least in those organs as the brain and lungs, in the former of which softening and in the latter compression may terminate in death before either of these symptoms has become conspicuous. General dropsy does not often occur and is never great. Ascites frequently accompanies carcinoma of the liver.

Cancerous Dropsy.—Dropsy of the inferior extremities occurs more frequently in cancer of the ovaries and uterus than of any other organ. It is the consequence of compression of the iliac veins, but it may also be occasioned by the extension of the inflammation which accompanies the ulcerative stage of the disease to these vessels. Compression of the vena cava by tumors in the liver, or by the enlarged mesenteric glands, may also give rise to the same state of the inferior extremities.

Colloid Cancer.—Colloid or alveolar carcinoma is characterized by the stroma being tolerably thick and so arranged as to divide the mass into a number of cystiform chambers, or alveoli, which are occupied by a jelly-like substance. Generally pale and transparent this may be firm as the white of a hard-boiled egg in the older cells, or of the consistency of half dissolved glue or currant jelly. In any form it is non-adherent to the walls of the cells, and may be readily removed. The disease assumes two forms, the circumscribed and infiltrated. The former is met with in subcutaneous tissue and in the bones of the extremities, constituting the osteo-sarcoma and spina ventosa. The latter is seen in the walls of the alimentary canal. It is of much slower growth than either of the above varieties, and rarely or never ulcerates or softens.

Black Pigment.—Melanosis is a form either of scirrhus or encephaloid, in which a deposit of black pigment has taken place.

Soft Cancer.—Encephaloid or soft carcinoma possesses a matrix less abundant and firm than in the preceding variety. So deficient is this that the mass is of jelly or brain-like consistency. Its cells are for the most part large, with a tendency to assume the caudate form. The growth may be circumscribed (forming tumors often of immense size), or it may occur in the tissues as an infiltration. It is elastic, occasionally fluctuating under pressure, as though pus was present. When opened it shows a whitish-yellow surface, dotted with pinkish spots during life. It is very vascular, giving a purplish-red tinge to the contiguous skin and possessing oftentimes a distinct fruit. Hemorrhage resulting from the spontaneous rupture of some of these vessels is not infrequent, forming apoplectic clots in the interior if confined, but constituting frightful loss of blood if rupturing the matrix. When ulcerated the surface of the tumor assumes a dark, sanguineous appearance, in which condition it is often described as *fungus hematodes.* From the first the peculiar cancerous cachexia is better marked in this than in any other kind of malignant growth. Its most frequent sites are the eye, cavities of face, articular ends of bones, the testicles, uterus and breast. The disease runs its course rapidly.

Skin Cancer.—Epithelioma or epithelial cancer differs from the above in having an imperfectly defined matrix which possesses a tendency to form concentric laminæ around the cellular elements. These are generally mixed up with altered epithelial cells of the part, and are more constant in their outline than other cancerous growths. Epithelioma is found chiefly at the margin of the mouth and at the anus, though it is occasionally seen on the hands and feet.

Cancer of Bones.—Osteoid cancer is defined as a malignant tumor, usually commencing in the bones, consisting almost entirely of bone and followed by similar growths in the glands and viscera.

Membranous Cancer.—Villous cancer is the name given to cancer in a mucous membrane when covered with a villous or velvet-like growth.

A host of remedies have been proposed for the cure of cancer; the greater number of them have been tried in almost every form of the disease, but they have nearly all failed to justify the high praises bestowed on their curative virtues.

Remedies.—**1.** The remedies which retard or arrest the progress of cancer consist of those which exercise a direct or indirect influence on the nutritive function of the affected organ. Among the former are those which operate directly—the local abstraction of blood by means of leeches and compression hold the first rank. The first of these means should be employed for a considerable length of time, at intervals of one, two or three days, and the quantity of blood taken should be regulated chiefly by the strength of the patient. The diminution of bulk of the original tumor which follows this mode of treatment is sometimes very considerable.

2. In the great majority of cases the tumor is not entirely removed. It may be reduced from the size of a hen's egg to that of a nut, and in this state remain stationary for years without giving rise to pain or any inconvenience whatever. The alternate use of local bleeding and compression effect more rapidly the reduction of bulk just noticed than when either is employed separately.

3. Although compression and local bleeding are employed beneficially they are by no means to be altogether relied upon. In consequence of a modification of nutrition in general, and consequently of that of the affected organ, the beneficial effects of some general remedies in carcinoma of external organs are chiefly to be attributed. Some of these remedies appear to modify nutrition by effecting some unknown change in the composition of the blood, as aconitum, conium and arsenic; others, by acting on the capillary circulation and absorption, as mercury, in alterative doses, and various preparations of iodine.

4. The beneficial effects of tonics, as preparations of iron, the fixed and volatile alkalies, mineral waters and all other remedies which increase the vital energies, invigorate digestion and promote absorption and secretion, may also be referred to a favorable change induced in the nutritive function of the affected organ by the introduction of these remedies into the circulating system.

5. The salutary operation of these local and general remedies is much increased by a judicious combination of both, regulated according to the circumstances of individual cases.

Diet.—But while employing any of these remedies it is of the utmost importance to regulate the diet and regimen of the patient in such a manner that neither of them may interfere with the operation of the remedy employed.

Virtues of Conium.—For example, the curative virtues of conium depend greatly on the quantity of food consumed by the patient, that is to say, the operation of this remedy is more or less powerful when only a small quantity of food was allowed and hardly perceptible when the quantity was considerable.

The following has been our experience with the use of conium in this disease:

1. The patient takes a dose of the extract of conium, morning and evening, two hours before each meal. The amount of the first dose is half a grain, which is gradually increased to six grains each time. This dose is

continued for about three weeks in order that the organs may become habituated to its operation, and is afterward increased to twelve grains each time, beyond which it is not necessary to carry the remedy because of its influence being sufficient. The twelve-grain dose is continued from two to four weeks.

2. After each dose of conium, as well as at meals, the patient uses a glass of the decoction of sarsaparilla.

3. Only the third of the ordinary quantity of food is allowed, which ought to be very simple and divided into three small meals.

4. If the conium disagrees in one form it should be given in another or the aconitum may be used instead, but in lesser quantity than the conium. Toward the end of the treatment the dose of the conium is gradually diminished and the diet gradually increased.

Further Remedies.—The only class of remedies which can be expected to afford any essential benefit are those that are capable of inducing a new condition in the system by modifying the function of nutrition, such as the various preparations of iodine, combined with a thorough change of everything surrounding the individual. The cachexia is the real morbid condition and the cancerous affections in particular organs are but so many evidences of it, as tubercles in the lungs are mere expressions or indications of another form of cachexia, equally possessing the whole system. Hence it is that cancerous tumors on the external parts of the body are so apt to recur after they have been removed by the surgeon.

Removal of Tumors.—Still it must be admitted that in cases of scirrhus tumors, when they have been removed early, there has very frequently been no return of the disease. In such cases the cachexia has been less strongly marked and time, apparently, has not been permitted for the local mischief to increase the morbid disposition. It would seem, too, that the particular species of cancer influences the probability of recovery. There are a few examples of permanent recovery after the removal of encephaloid tumors.

Remedies for Cancerous Fevers.—The remedies best calculated to prevent, remove or mitigate the local and general effects of carcinoma of internal organs vary with the nature of these effects and the seat of the disease. The state of irritation and fever and pain, at whatever period of the disease they may occur, may be greatly moderated by the use of conium, aconitum, opium, hyosciamus, the acetate or muriate of morphia, while at the same time the use of all kinds of stimuli is to be avoided, particularly if the digestive organs be the seat of the disease, and the patient himself kept as much as possible in a state of quiet of body and mind.

Treatment.—When cessation of pain and a return of strength and appetite take place, treatment is suspended for a month. It is then resumed for two consecutive months, then suspended for two months, and recommenced, continuing during a month. This plan is pursued for at least two years, which by pursuing the patient is not only greatly benefited, but frequently cured.

Ferruginous preparations must not be omitted when there is great anemia caused by profuse hemorrhage or imperfect nutrition.

Hemorrhages.—Hemorrhages are treated by rhatamy, sulphuric acid and ice. When they have been arrested, and when the pain is subdued, bitters, such as the decoction of cinchona, infusion of quassia, or of Columbo root, are given; sometimes also certain remedies which combine bitter with slightly purgative properties, such as rhubarb, are used; and finally the preparations of iron.

Classes of Remedies.—The only class of remedies that can be expected to afford any essential benefit are those that are capable of inducing a new condition in the system, by modifying the function of nutrition, such as the various preparations of iodine, combined with a thorough change of everything surrounding the individual. The cachexia is the real morbid condition, and the cancerous affections in particular organs are but so many evidences of it, as tubercles in the lungs are mere expressions or indications of another form of cachexia, equally possessing the whole system. Hence it is that cancerous tumors on the external parts of the body are so apt to recur after they have been removed by the surgeon. Still it must be admitted that in cases of cancerous tumors, when they have been removed early, there has been frequently no return of the disease. In such cases the cachexia has been less strongly marked, and time, apparently, has not been permitted for the local mischief to increase the morbid disposition.

Mitigation of Pain.—When the carcinoma or cancerous disease has arrived at that period when the cancerous cachexia announces the extensive and fatal termination of the disease, the efforts of the physician must be directed solely to the mitigation of the sufferings of the patient. If this symptom were removed, there are many cases in which carcinoma would run a much longer course, and give rise to comparatively little functional derangement.

Termination of Cancer.—With regard to the termination of cancerous affections of the hollow organs, it takes place frequently in the uterus and stomach, the rectum and urinary bladder, the transverse arch of the colon and jejunum, and the peritoneum. The perforation of the rectum, bladder and peritoneum is the consequence of the extension of the disease from the uterus; that of the transverse arch of the colon, the consequence of its extension from the stomach.

If the os uteri be the seat of the disease additional benefit may be derived from the use of leeches applied to this part, and also sedative injections. It is only in this latter situation that sloughing and ulceration can be detected, and local remedies applied to remove some of the disagreeable effects of the one, or retard the progress of the other. Antiseptic disinfectants are perhaps the best remedies we can employ in this case, as they not only destroy the disgusting odor which accompanies this stage of the disease but remove the putrid and irritating fluids which are then discharged. The retention of the contents of hollow organs from compression or obstruction is an occurrence to be guarded against by regulating the quantity and quality of food, for negligence in this respect may be followed by fatal consequences if the obstacle be situated in the intestines.

Further General Treatment.—The same general treatment is applicable to all forms of cancer. If the growth be well defined, as in carcinoma of the breast, of not very long standing and not involving neighboring lymphatic glands, it may be removed, but severe hemorrhage from a large encephaloid cancer or the complication of important structures in any variety having deep attachments will preclude any operative procedure. Even when extirpated under favorable conditions it is very apt to return, eventually to destroy the patient. The removal of epithelial growths by the knife, or their destruction by caustic applications before glandular evolvement has supervened, in many instances may effect a permanent cure.

Care in Removing Cancerous Growths.—When a cancerous tumor has been removed all surrounding parts should be carefully examined, because it is not uncommon to find small cancerous tubercles in the connective tissue, fascia or muscular sheaths, which, if passed by unheeded, would soon increase and give rise to a recurrent growth.

COLLOID.

Characteristics.—This new growth, formerly called colloid cancer-gelatinous or gum cancer, is no longer considered to be malignant, in the sense of its having the power to infect other and distant portions of the system. Its great characteristic is the formation of a new growth in the large open meshes of which it exists a glue-like, gelatinous, transparent substance like half dissolved gum arabic. This matter is strikingly transparent. Greenish-yellow is its predominant hue. This jelly-like matter is exceedingly soft; a colloid mass is, however, firm and resisting, although not apt to be produced elsewhere, these growths may obtain an immense size and even prove fatal by the disturbances which they cause in the system. Fortunately they are quite rare in this country.

NOLI ME TANGERE OR LUPUS.

Character.—This is a spreading, tuberculosis inflammation of the skin, usually of the face, tending to destructive ulceration. Its name is supposed to be derived from a fancied resemblance which the sores left in the progress of the disease have to the bite of a wolf.

Symptoms.—1. The "lupus erythematosus" occurs chiefly upon the face, and is symmetrical; each patch has well-defined edges and a red, scaly surface with small horny points upon it, due to accumulation in the dilated mouths of sebaceous ducts.

2. The "lupus vulgaris" has its origin in a skin tubercle, or tubercles, of a flat form, flehsy consistence and pink shining appearance, and these at times ulcerate. This lupus ulceration, when once originated, progresses steadily, destroying every tissue it attacks and when it reaches the nose, its favorite seat, it simulates cancer.

Treatment.—In the treatment of lupus, although the disease has probably a constitutional origin and requires tonic treatment, both by medicine and regimen, there is no disease that derives more benefit from local treatment. Quinine, with vegetable tonics; cod-liver oil, and iodide of potassium are all useful in this respect. When the ulceration is superficial and the skin is not deeply infiltrated, the local application of cod-liver oil on lint and the covering up of the part with cotton to keep it warm has in some cases worked wonders.

GOUT OR PODAGRA.

Character.—A painful disease affecting principally the fibrous tissues about the smaller joints and intimately connected with an excess of uric acid and its compounds in the blood. Various names have been given according to the part affected, as podagra when in the feet, chiragra when in the hands, and so forth, but all such and probably many cases of neuralgia, accompanied by oxalic deposits in the urine, are mere forms of one disease.

Symptoms.—A common attack of acute gout is generally preceded by uneasiness, indigestion, loss of appetite, nausea and vomiting, biliary derangement, dull pains or numbness in the parts affected, often with feverish symptoms; but in some cases, on the contrary, the disease comes on in the midst of apparent health and well-being, and ocassionally at night during refreshing sleep. In most cases it makes itself known by an acute pain in the joint of the great toe.

Further Symptoms.—This is accompanied by feverish symptoms, urinary sediment, extreme tenderness, restlessness, involuntary muscular contractions, sleeplessness and perspiration; the affected joint is swollen, red and hot. This series of symptoms may last four or five days, to be followed after a day or two by three or four others, continuing in all from two to three weeks; the severity of the attack, its persistence, its seat and its metastases vary according to circumstances.

Chronic Gout.—When gout becomes chronic the attacks are more irregular, less severe, more frequent and sudden, leaving one joint for another after slight exposure to cold and moisture, excess at table or vivid emotions; in this form the continuance of the pain and the fear of injuring the gouty joints render its subjects cross, fretful and disagreeable.

Chalky Deposits.—Toward the end of the spell chalk-like deposits are thrown out about the joint in some, but not in all cases. The suffering with the gouty inflammation is often very intense.

Hereditary Gout.—Hereditary gout is sometimes podagra or foot-gout, but more often is of the hardening kind. Neuralgia, indigestion, palpitation and urticaria or eczema upon the skin are its most common manifestations. In such a system rheumatism and other affections are to a considerable degree modified by the "gouty tendency."

Causes.—High living with indolent habits generates gout. Even excess of animal food, with scanty exercise, has been known to produce it. But strong wines and malt liquors much increase the tendency. Weak wines do not seem to have the same effect.

Diagnosis.—Between gout and rheumatism there is great resemblance. In gout the small joints are chiefly affected; in rheumatism the larger joints. Repetition of attacks is much more frequent in gout; their duration is greater in rheumatism. In gout the heart is seldom attacked and spasmodically; in rheumatism the heart is often subject to inflammation. In gout the stomach is sometimes spasmodically affected with violent symptoms; in rheumatism, almost never. In gout, and not in rheumatism, uric acid is in excess in the blood. In pure gout, colchium does good; in rheumatism, hardly ever.

Treatment 1.—There are few diseases which have more empirical remedies extolled for their cure than gout; almost every drastic purgative, diuretic, tonic and narcotic has been pressed into the service either for external or internal use. To say nothing here of soothing topical applications, colchicum has enjoyed, and deservedly, a great reputation in the treatment of gout and neuralgia between the attacks and in their chronic forms; it is most efficacious when it acts upon the skin and bowels. The acetate of potash and other alkalies are in favor both for their diuretic property and as alkalizing the acid in the blood and urine.

2. During the attack colchicum and the alkalies are the remedies. Wine of the root of colchicum may be given in ten- or twenty-drop doses several times daily. The stomach and bowels are sometimes irritated by large doses; but for a few days most patients will bear fifteen drops thrice daily. It should be stopped when relief has been obtained. Carbonate of potassium—ten to thirty grains at once with half drachm doses of rochelle salts will be important in addition. Opiates or other anodynes may be craved by the patient during the extremity of his pain.

3. Gouty attacks affecting the stomach or heart spasmodically are usually sudden, violent and prostrating, requiring prompt stimulation, as brandy, laudanum, Hoffman's anodyne, chloroform or Warner's cordial (tinct. rhei et senna). Small or moderate doses of one or another of these should be given at short intervals. Mustard plasters to the epigastrium or chest and back will be important, and the feet may be placed in hot mustard water for revulsion.

Diet.—Regulation of the diet is of primary importance. But it should not be too low, especially when the patient's habits have been those of free living. Nourishment must be full, while the digestive power is economized and positive stimulation avoided. Attention to hygienic rules and avoiding exposure to dampness, cold and fatigue of body or mind are absolutely necessary as aids in the treatment of this disease. To promote all this adequate exercise is the natural agent, the use of which cannot be superseded by any medicines however valuable or however lauded.

Change of air, traveling and mineral waters are generally useful during the intervals between the paroxysms. Alkaline springs and baths have an especial reputation as prophylactics against gout.

ELEPHANTIASIS OR TRUE LEPROSY.

Symptoms.—This is a constitutional, hereditary affection, essentially chronic in its nature, showing itself mainly as shining tubercles of different sizes, of a dusky red or livid color, on the face, the ears and often on the legs, the skin being thickened, wrinkled, rough, unctuous, devoid of hair, and the perspiration from it highly offensive. After a time there is a circular margin losing the central red part free from scales and quite resembling the irregular scaliness of psoriasis.

When the local disease has reached its highest degree a remarkable constitutional affection appears. The patient then becomes very languid, asthmatic, particularly at night-time; smothering fits seize him, he coughs violently and spasmodically, and spends the night in perfect sleeplessness, falling into excessive, colliquative, clammy sweats, which give an intolerably fetid odor. His voice becomes weaker and hoarser, the appetite for food and drink is preternaturally increased, and the temper becomes gloomy. Finally, various nervous symptoms arise—faintings, convulsions, paralysis of some parts—and death arrives, preceded by the highest degree of exhaustion.

Causes.—Its origin has been ascribed to want of cleanliness and to unwholesome diet, especially the constant use of bad fish, to long-continued exposure to the heat of a tropical sun, to dampness of situation or occupations requiring the frequent immersion of the limbs in cold water.

Where Occurs.—The disease occurs chiefly in warm climates—Arabia, China, India and some of the West India Islands.

Dry Leprosy.—In this the wasting of the disease is circumscribed, and limited to all the muscles of the hand. The skin is thick, reddened, and completely anesthetic; the fleshy masses have entirely disappeared, and the fingers assume the shape of claws. This disease rarely attacks women. It is accompanied with great torpor of mind and sluggishness of body. Mental depression amounting to extreme melancholy is the natural consequence of so hopeless a malady. Yet the general health, for a length of time, suffers infinitely less than could have been anticipated, the actions of the respiratory and digestive organs continue longer unaffected, and even the cutaneous functions are still tolerably performed, as is evidenced by abundant perspiration.

Progress of the Disease is very slow, and its termination, though it may be deferred for many years, is almost always fatal, the unfortunate patient being in the meantime dreadfully deformed and mutilated, and literally dying by inches. The patches spread slowly till the surface of the whole body may be at length inflicted, and its sensibility lost. There is neither pain nor itching, and usually no swelling. After a few months the internal functions become deranged, the pulse gets very slow and heavy, "as if moving through mud," the bowels grow costive, and there is much sluggishness of mind, and tendency to somnolency. The skin of the extremities becomes fissured and rough, and ulcers appear under the metatarsal or metacarpal joints—the integuments seeming to be simply absorbed—or sloughing off in successive layers of about half an inch in diameter, without any previous tumor, suppuration or pain. A serous discharge ensues and there is loss of sensation and a tendency to ulceration and death of the parts. In the advanced stage of the disease the eyes are fierce and staring, and the voice hoarse and nasal.

Character.—Leprosy is not a contagious disease, but is propagated by inheritance, depending on some specific taint transmitted from parents to children. The two forms of this horrible disorder are the tuberculated and the non-tuberculated or anesthetic.

Treatment.—The only hope of exterminating this dreadful disease appears to lie in the adoption of hygienic measures tending to improve the general condition, both physical and moral, of the leprous poor. Without this medical treatment is of little or no avail, but with the aid of improved sanitary surroundings, tonics and alteratives, especially preparations of iron and iodine, have a very beneficial effect. Much may be hoped also from the systematic employment of baths, either saline or sulphureted, in this affection.

Leprosy Germ.—A bacteria claimed to be the cause of leprosy, and named the bacillus leprar, was discovered in Norway in 1874, and its existence in the tubercles of this disease has been confirmed, although its causative power has not yet been completely demonstrated.

An external remedy is as follows:

Corrosive sublimate	2 grains
Infusion columbæ	5 ounces

A teaspoonful twice a day.

Arsenious acid	20 grains
Cosmoline	1 ounce

Make ointment. Over a patch of skin three or four inches square rub the ointment in well once daily for about two weeks, then treat a fresh portion until the body is covered.

SCROFULA.

Causes.—A blood disease manifesting itself in a great variety of organs and characterized when fully developed by the presence of a peculiar unorganized matter termed scrofulous. The causes are chiefly hereditary transmission and deprivation of pure air. It is closely allied to pulmonary consumption.

Symptoms.—The scrofulous habit, when strongly marked, is easily recognized. The skin is usually delicate and irritable; the patient suffers very readily from chilblains, and in childhood is more liable than others to cutaneous diseases. The mucous membranes partake the delicacy and irritability of the skin. The edges of the eyelids are apt to be red and swollen; the eye is very liable to be attacked by inflammations; hemorrhages from the nose, cold in the head and enlarged tonsils are frequent. The muscles commonly want firmness, and the whole system is deficient in stamina.

Diagnosis.—Scrofula is eminently a disease of childhood, while consumption belongs to a later period, but neither is confined to any age. One of the forms in which scrofula most commonly and earliest shows itself is swelling of the lymphatic glands in various parts of the body, more particularly about the neck. These become enlarged and firmer, and after a time a deposition of the peculiar curd-like matter is found to have taken place in their interior. After a time suppuration occurs, the swellings become softer and the skin over them assumes a dusky red hue, gradually becomes thinner and finally bursts, giving outlet to an unhealthy pus mixed with the curd-like deposit of the disease. The ulcers left heal slowly and with difficulty, and unless great care is exercised produce deformed cicatrices.

Treatment 1.—In the constitutional treatment of these cases of strumous adenitis, nutritious food, suitable warm clothing, attention to cleanliness and residence in pure air are the most important requisites. Iodine in its different forms, especially the syrup of the iodide of iron, is given in doses of twenty-five drops thrice daily, and quinine and iron each in grain doses three times a day, with one-sixteenth of a grain of arsenic, or phosphites and hypophosphites of lime and magnesia, in tablespoon doses of the syrup, are frequently of great service. Also the iodide of ammonium in three-grain doses three times a day.

2. In endeavoring to produce a reduction of the swollen glands by causing an absorption of the contents, the tincture of iodine painted on with a camel's-hair brush, or small feather, so as to smart severely but not to raise a blister, and repeated daily for a week or so until the skin peels off is a valuable resource. A milder application of the same remedy is by the use of the ointment of iodine rubbed into the skin over the enlarged gland, night and morning, for weeks and even months if requisite.

3. Cod-liver oil is an anti-strumous remedy of great power, and is more readily taken by the young than by adults, generally sea bathing and sea air are mostly the best of remedies.

Ophthalmia.—Strumous ophthalmia occurs in children between the time of weaning and the end of the ninth or tenth year. Its chief symptoms are redness of the white of the eye, with the formation of little blisters or pustules, often ending in minute ulcers on the cornea or clear portion. The eyes water very freely, and the intolerance of light is excessive, so much so as almost to be indicative of the disease.

Treatment.—The management of these cases will tax the skill of both nurse and doctor to the fullest extent, although internal remedies are often also required, the nursing and outward applications are the most important. Great attention must be paid to cleanliness, and warm bathing of the eyes with anodyne fomentations are very serviceable. Applications of the wine of opium or of a solution of nitrate of silver, of a strength of from five to ten grains in an ounce of water, although they smart severely at first are often of very great benefit.

Diet.—Good diet is indispensable in strumous affections. Hence the invalid should have all the advantages of an abundance of good mutton and beef, vegetables and ripe fruits in season, raw eggs, milk and cream, tepid or cool baths and sea air.

PRESCRIPTION 1.

℞.—Cod-liver oil	5 ounces
Phosphorus	3 grains

A teaspoonful once a day.

PRESCRIPTION 2.

℞.—Citrate of iron and quinine	10 grains
Cod-liver oil	1 ounce
Glycerine	1 "

Take a tablespoonful three times a day.

RICKETS.

Causes.—The cause of rickets seems to be anything which induces enfeebled assimilation of food and impaired nutrition of body. Hence this affection is sometimes met with in such weakly children of even wealthy parents as suffer from defective action of the vital forces. Like scrofula, it is, however, especially a disease of the poorer classes. Insufficient and especially improper food, the constant respiration of foul, impure air, residence in dark, damp, cold or filthy dwellings, these and similar circumstances readily serve, in all probability, to generate rickets.

Symptoms.—This disease rarely appears before the seventh month, and most commonly does not declare itself until the child first begins his attempt to walk. When a child is about to be affected with rickets he becomes dull and languid, the appetite is variable and capricious, the bowels are irregular, the stools unhealthy and usually pale. Constitutional disturbance now arises, and a febrile state is soon established; the limbs become emaciated; the belly tumid; the face full and the head disproportionately large; the forehead projecting, and the sutures of the cranium remaining open or perhaps expanding slightly. The extremities of the long bones which are least concealed by muscle, as those of the wrists and ankles, and the sternal ends of the ribs, particularly these last, are swelled out into knobs. The legs begin to bend outward at the knee, giving rise to the deformity of bow-legs, or less frequently the knees are thrown forward and the feet outward, making the child what is called knock-kneed, and usually crippling it more or less for life. The bones of the arms and the collar bones may also become very much curved and twisted, showing that the popular delusion as to the cause of bow-legs has little foundation in fact. The deformity of the chest is often very great, the back being flatened, the breast bone pushed forward and the natural curve of the ribs lessened. In such cases the child is said to be pigeon-breasted.

Diagnosis.—This, of course, must be difficult in the early stage, as the symptoms closely resemble scrofula at that time, but after the curvature of the bones commences there can no longer be any doubt, as such softening of the bones during childhood only occurs in rickets.

Treatment.—The medical treatment of rickets must be subordinate to the hygienic, since far more depends upon good food, proper clothing and pure air than on drug medication. Milk diluted with lime-water, Liebig's food, and, if the infant is old enough, beef tea, extract of beef, raw meat, eggs, and so forth, should be given in abundance. The phosphates or hypophosphates of iron, lime, quinine and strychnia, as recommended when treating of scrofula, are very useful, and if the child is capable of digesting cod-liver oil it ought also to be administered. Should the diarrhœa be troublesome a chalk and soda mixture, containing a grain of each as a dose for a baby one year old, or a mixture containing a grain of bismuth in each dose for an infant of that age will probably be of essential service, and after the feverish symptoms are controlled the child, in suitable weather, should almost live in the open air, especially if a seaside atmosphere can be obtained.

Diet.—If the disease has occurred at a very early age it may be advisable to try the effect of changing the wet-nurse; and in general it will be proper to wean the child about the end of the ninth month, for protracted suckling is certainly one of the debilitating causes which dispose to rickets. While the child continues at the breast the diet of the nurse or mother ought to be carefully attended to, in order that the milk may prove nutritious and easy of digestion; or its powers may be assisted by allowing the infant, in addition, small quantities of isinglass jelly, beef tea, or yolk of egg, provided the absence of febrile excitement will permit. After the child has been weaned the diet must be suited to the degree of constitutional irritation which exists; but one leading principle should be to support the strength as much as possible without quickening the circulation or oppressing the stomach.

CRETINISM.

Causes.—A condition of persons in whom partial or complete idiocy is combined with great bodily deformity of the whole body, due to bad water, lack of sunlight, and life in deep valleys like those of the Alps.

Symptoms.—There are three varieties: first, complete or incurable cretinism, which is characterized by idiocy, deaf-dumbness, deficiency of general sensibility and entire absence of reproductive power; second, semi-cretinism, which is a degree of the malady in which the mental faculties are limited to the impressions of the sense and the bodily wants. The general sensibility is obtuse, the head is badly formed and drooping, the speech is rudimentary and the reproductive powers are feeble or absent; third, incomplete or curable cretinism in which the mental faculties, though limited, are capable of development.

Treatment 1.—The first thing to be accomplished is the removal of the young cretin, as soon as possible after the disease exhibits itself, to a pure bracing atmosphere.

2. The treatment requires an abundance of pure water for drinking, washing and bathing; warm and cold baths and douches; friction of the skin with brushes and stimulating liquids to rouse its action; warm clothing; mineral tonics; nourishing food; iodine, cod-liver oil and phosphates. The effort to develop the mind must follow the attempt to restore the body to a healthy condition.

DIABETES OR DIABETES MELLITUS.

Causes.—Twice as many men as women have this disease. It is most frequent among young and middle-aged adults; the mortality from it being greatest from fifteen to fifty-five. It is more common in cities and manufacturing districts than in the open country; occasionally it is hereditary. The exciting causes appear to be exposure to cold and wet; drinking cold water largely when heated; excessive use of saccharine food; intemperance; violent emotion; febrile diseases, and organic affections and injuries of the brain and spinal cord.

Symptoms.—In this remarkable disease there is an excessive discharge of urine containing grape-sugar, the saccharine principle of grapes and of honey called glucose, being produced in the body in great quantity and eliminated from the kidneys. The exhaustion, which results from the immense loss of fluid, sometimes amounting to several gallons daily, is often accompanied by other disturbances of the system due to the presence of sugar in the other secretions and in the blood and to the modifications of the nutrition thus effected; opacity of the crystalline lens of the eye—constituting diabetic cataract—is occasionally one of the modifications of structure; shrinking of the substance of the brain is another, and a peculiar form of inflammation of the lungs is another. It is a disease which commonly, after a longer or shorter course, proves fatal.

Diagnosis.—The detection of sugar in the urine, not temporarily, but for a considerable time, is of itself sufficient to make out the case.

Prognosis.—Recovery is not impossible in diabetes, but a large majority of cases end in death. Amelioration—keeping the disease in abeyance—is often an attainable end.

Treatment.—The most positive influence in diminishing the disease belongs to opium; but this does not appear to interfere with the progress of the disease. The alkalies, pepsin, iron, quinine, salicylate of soda, alum, iodine, nitric acid, turpentine and the inhalation of oxygen have all been employed.

Diet.—Since it is found that the amount of sugar discharged in the urine fluctuates very much in accordance with the starchy and saccharine materials which are eaten, it is the best for the diet of a diabetic patient to be freed, as far as possible, from substances which can be converted into glucose by the digestive organs. Hence the effort should be, in treating diabetes, to abstain from all starchy food as well as from every solid and liquid containing sugar. That meat and eggs may be taken as a derangement of the liver is not found to be produced by them, and fish is a most important article with which to vary the monotony of the diet. Skimmed milk appears to answer a very good purpose in this disease.

The following prescription is of value in diabetes mellitus:

℞.—Salicylate of soda	3	drachms
Fowler's solution	1	drachm
Glycerine	1	ounce
Water	1½	ounces

Mix and take a teaspoonful three times a day.

PURPURA OR LAND SCURVY.

Causes.—It chiefly occurs in individuals of delicate habit or enfeebled by their occupations or mode of life; by confined, low or damp habitations, scanty food, hard labor, grief, anxiety, fatigue and watching. On the other hand purpura frequently occurs where no causes of a debilitating or depressing nature can be supposed to have existed.

Varieties.—The two varieties which are distinguished are the simple and the hemorrhagic, in the latter of which the malady is accompanied by bleeding from some of the mucous membranes of the body.

Symptoms.—Various symptoms denoting general disorder of the system precede the appearance of the spots in purpura, generally for some weeks. In most instances languor, weariness on very slight exertion, faintness and gnawing pains in the stomach are complained of. The appetite is variable, generally poor, but sometimes there is an inordinate desire or craving for food. The tongue is yellowish and coated with a viscid fur, the countenance sallow or dingy, or the face may have a pale and bloated appearance with swelling beneath the eyelids. The purple spots usually appear upon the legs and afterward without any certain order on the thighs, arms and trunk of the body, and their formation is attended with great weakness and much depression of spirits. Deep-seated pains are felt about the region of the stomach as well as in the chest and loins. One of the most distressing and dangerous symptoms is when the patient becomes of a sallow complexion, waxy-colored and dingy, dropsical swellings of the feet and legs with deep and gangrenous sores appear, general dropsy often prevails and the sufferer dies exhausted.

Diagnosis.—The diseases with which purpura is most likely to be confounded are typhus fever attended with scurvy. The origin and course of the complaint, the period at which the petechiæ appear, the extent and variety of the accompanying hemorrhages will make its diagnosis clear.

Treatment 1.—In the treatment of this disease we are not to be guided by the name or external appearances, but by diligent attention to the symptoms and especially to the state of the functions and the habit and constitution of the patient. Where high excitement prevails with strength of pulse and vigor of constitution, and we have reason to suspect inflammation, purging, with a suitable antiphlogistic diet, are the appropriate remedies.

2. Where a quite opposite state exists all active depletion must be abstained from and the strength supported by beef-tea and other meat nutriment; at the same time tonics, such as quinine or Peruvian bark, the diluted mineral acids in five- or ten-drop doses, iron and strychnine, must be administered.

The following offers a good treatment:

℞.—Syrup of the superphosphate of iron	1½	ounces
Liquor of peroxide of hydrogen	1½	"
Glycerine	1½	"
Water	1½	"

Take a tablespoonful three times a day.

Or,

℞.—Oil of turpentine	3	drachms
Fluid extract of digitalis	1	drachm
Mucilage gum-arabic	1½	ounces
Peppermint water	1	ounce

Make an emulsion. Take a teaspoonful every three hours.

SCORBUTUS OR SCURVY.

Character.—This is a disease allied to purpura, but attended with a spongy condition of the gums, and livid patches under the skin of considerable extent, which are harder than the surrounding structure. It has been stigmatized as the great plague of the ocean, and has been denominated sea scurvy to distinguish it from land scurvy or purpura.

Causes.—That the essential cause of scurvy is deprivation of fresh food, and, in almost all cases, of fresh vegetable food, is proved. Fresh meat will retard it in the absence of vegetables, but neither this or oranges and lemons will altogether prevent it through long periods. Additional promotive causes are severe cold, fatigue, exposure and mental anxiety or home-sickness.

Symptoms 1.—Languor, debility and lowness of spirits first occur; then swelling, sponginess and bleeding of the gums; the teeth loosen, and the breath is offensive. Palpitation of the heart and dyspnœa may be present. Spots (from subcutaneous extravasation of blood) appear on the limbs. Diarrhœa and dysentery often come on. Death may take place by a gradual exhaustion or by sudden syncope.

2. A remarkable peculiarity of scurvy is the readiness with which all parts of the body suffer from pressure, and the slightest possible blow may produce an extensive bruise, a small eruption like flea-bites is often to be seen on the legs, and about the same time the muscles of the legs and thighs are apt to become hard and painful, and in a day or two the skin

over the painful part grows yellow and then purple. These purple spots may be as large as the palm of the hand at first, and are liable to extend until they cover half of the limb.

3. As the disease advances all the symptoms become aggravated. The loss of physical power increases, the purple spots have a tendency to ulcerate, and the resulting ulcers are especially distinguished by their putrid fungoid appearance, and their great tendency to bleed.

Diagnosis.—Purpura hemorrhagica is undoubtedly not identical with scurvy, although "purpuric" extravasations are common to both. Purpura does not depend, as scurvy does chiefly, upon a fault of diet; nor are the gums affected in purpura.

Treatment 1.—The great remedy for scurvy is lemon or lime juice; in seemingly desperate cases the most quick and sensible relief has been obtained from lemon juice, when no other remedy seemed to avail. When the acid operates violently upon the stomach and bowels of those who are much weakened, the addition of wine and sugar is strongly recommended.

2. A solution of nitrate of potash in vinegar has been most advantageously made use of in the proportion of two ounces of nitrate in one quart of vinegar, and a tablespoonful of this given two or three times a day.

3. Fresh vegetables alone will restore what is wanting. Potatoes, tomatoes, oranges and lemonade are the most generally available articles. If any medicine is useful as an adjuvant, it is the tincture of the chloride or iron in moderate doses. Sometimes citric acid does good. For the gums a wash of tannic acid or tincture of myrrh in diluted glycerine will be useful, or alum, brandy and water. Salt and whiskey rubbing of the skin will aid in dissipating the petechiæ.

Diet.—Medical men in charge of expeditions to a distance, for ordinary supplies should always insist on measures being taken to furnish enough fresh vegetables, or, next best, dessicated potatoes; after the latter onions, tomatoes, turnips, and so forth, and oranges and lemons rank. Wine is also decidedly though not infallibly anti-scorbutic.

The following is a good anti-scurvy remedy:

℞.—Common salt	10 scruples
Chlorate of potash	½ ounce
Rochelle salts	5 scruples
Phosphate of soda	3 "
Lemon juice	6 ounces
Syrup of lemon	14 "
Water	7 pints

To be used as a drink several times a day.

CONSTITUTIONAL SYPHILIS.

Weeks or months after the primary disease, secondary syphilis may show itself. Once produced, although sometimes readily curable, it often impairs the constitution for life, and transmits the taint to offspring.

Symptoms.—The affections belonging to secondary syphilis are peculiar copper-colored eruptions, rupia especially; warts about the genitals, ulcers of the throat, iritis, loss of hair, affections of the testicle or uterus. These last, as well as periostitis and osseous tumors or nodes, cutaneous tubercles, and chronic degenerative inflammations of the brain, spinal marrow, liver, spleen, lungs, and so forth, are often called tertiary syphilis. It has been our experience that constitutional syphilis is not transmissible by inoculation.

Treatment.—Mercury is available in the treatment of secondary as well as primary syphilis, but its power over it is less absolute. After moderate trial of its impression (especially of the iodide of mercury) iodide of potassium may be given, from ten to thirty grains thrice daily. It is an almost certain cure for syphilitic rheumatism or bone pains, with or without nodes; over ulcers of the throat, also, it has great power. Such things, however, often do not stay cured, they break out again, as may also the cutaneous eruptions, requiring the same treatment over again.

The following are excellent remedies:

℞.—Iodide of potash	2	drachms
Carbonate of ammonia	½	drachm
Compound tincture of cinchona	4	drachms
Syrup of orange peel	1½	“
Glycerine	1	ounce

Take a teaspoonful after each meal.

℞.—Iodide of potash	3	drachms
Iodine	1	drachm
Corrosive sublimate	2	grains
Water	3	ounces

Take a teaspoonful three times a day.

ANEMIA.

Causes.—Poverty of blood. This is a special, morbid state, in which there is fullness of the surface of the body and deficiency of the red corpuscles of the blood. It is a common affection among women, and persons of both sexes who are ill-fed, or from any cause badly nourished, in crowded localities. It is occasioned by loss of blood, from disease or injury causing hemorrhage, from excessive suckling in a mother or wet-nurse, severe or protracted diarrhœa, or (more rarely) leucorrhea, typhoid or other forms of fever; the malarial influence, sustained for a considerable time; deficiency of food, light, warmth, or fresh air.

Symptoms.—The face, the hands, and the general surface are pallid and slightly waxen or icteroid in their hue. There are vertigo, faintishness, palpitation and an impaired action of the organs generally, especially of the stomach and bowels; digestion being deranged, with flatulency, constipation, and so forth.

Diagnosis.—This is very much aided by the detection of various murmurs, as the watery blood passes through the heart and larger veins. The jugular veins of the neck are often the seat of a well-marked venous hum in profound anemia.

Treatment 1.—In almost all cases it is essential to put the patient on nourishing diet, and especially where the anemia has been caused by imperfect nourishment; yet care must be taken in the very impressible condition of the system which exists in these cases, that undue excitement be not induced.

2. Our first effort should be to supply the materials for enriching the blood, and especially those which are necessary to construct the red corpuscles, a deficiency of which appears to be the essential element in this malady. Iron, which enters into their constitution more abundantly than of any other tissues of the body, is hence obviously called for, and should be administered in whatever form can best be assimilated. Where it is well tolerated there is probably no better preparation than tincture of the chloride of iron, in twenty-drop doses three times daily.

3. In cases where the tincture of the chloride of iron is not applicable, or is objected to by the patient, the powdered iron, called also iron reduced by hydrogen, in doses of a grain thrice daily, can almost always be borne, and is frequently of the greatest service. All the compounds of iron require, however, to be used for a long time, usually several weeks and often for several months, in order to cure the anemic condition.

4. The citrate of iron or the citrate of iron and quinine, in doses of from three to five grains, possesses one great advantage over many other preparations of this useful metal in the fact that while perfectly soluble they produce upon the organs of taste little of that styptic or ink-like impression which to many persons is so exceedingly disagreeable. The beef, wine and iron is also a most valuable remedial agent.

Diet.—The best food which the stomach can digest, and there is no doubt that the iron which exists in beef and mutton and gives much of its red color to the muscular fibres of the flesh, is in the most favorable state for assimilation into the human system, and often has a large share in the improvement which we are perhaps too ready to attribute to the chemical compounds prescribed.

℞.—Corrosive sublimate	2 grains
Liquor of chloride of arsenic	1 drachm
Diluted hydrochloric acid	½ ounce
Tincture chloride of iron	½ "
Syrup	3 ounces
Water	2 "

Take a dessertspoonful in a wineglass of water after each meal.

BERI-BERI.

This is a very fatal but obscure disease occurring in Ceylon, the Malabar coast and outer ports of British India.

Causes.—The causes are very obscure. It is a disease of debility, arising from a want of stimulating and nourishing diet, impure air and exposure to a moist and marshy atmosphere while the frame is debilitated by residence in an unhealthy station.

Symptoms.—It commences with the symptoms of anemia and proceeds to the development of acute dropsy.

Diagnosis.—The paralytic symptoms, together with the dyspnœa and dropsical effusions are sufficient to distinguish it from other diseases. In no disease is internal congestion so strongly marked, doubtlessly due to the congestion of blood in the brain and spinal marrow.

Treatment 1.—Mercury here appears to be the sheet-anchor, but must be administered to produce ptyalism. Saline and antimonial medicines will be called for and the strength supported by cordial liquors. Stimulating liniments should be applied to the extremities and a tonic plan of treatment pursued.

2.—In the more severe cases where the dyspnœa, vomiting, spasms and other symptoms are violent apply blisters to the breast, hot fomentations and hot baths, and exhibit the strongest cordials and antispasmodics.

℞.—Muriate of pilocarpine	3 grains
Water	½ ounce

Inject 10 to 20 minims with hypodermic syringe.

GENERAL DROPSY.

Definition.—A morbid collection of fluid in one or more of the serous cavities within the body or in the areolar tissue beneath the skin and in other situations.

Causes.—A dropsical accumulation is to be distinguished from the effusion of liquid which takes place in certain inflammatory diseases, pleurisy, peritonitis, pericarditis, and so forth. In other diseases the effusion is due to inflammation, whereas in dropsy transudation takes place intact, the part where it occurs being inflamed.

Local Dropsy.—Dropsy may be local or general. It is local when the effusion of liquid is confined to a single serous cavity or to the areolar tissue within a limited space.

General Drppsy.—Dropsy is said to be general when effusion into the areolar tissue beneath the skin exists more or less over the whole body, accompanied with effusion into certain serous cavities, especially the pleural and peritoneal.

Symptoms.—The symptoms of dropsy vary somewhat, according to the primary disturbance which has been the original cause of the effusion. If the blood is deteriorated by an undue proportion of water or is charged with excrementitious materials, such as urea, which ought to be eliminated by the kidneys in the urine, or contains a large excess of white corpuscles, its circulation through the capillary vessels is much impeded. The dropsy in these cases often begins in the form of odema or swelling about the feet and ankles. The reproductive organs often become enormously swollen and ascites or dropsy of the abdomen soon sets in. After a time the increasing ascites, by pressing up the diaphragm, interferes with the respiration, causing distressing dyspnœa, which is more urgent in proportion as the blood is watery from anemia. The urine is often scanty and apt to contain an excess of urates, but it is only markedly albuminous when, as frequently happens, the kidneys become secondarily implicated. Among the latter symptoms are palpitation of the heart, deficient perspiration, mental distress, thirst, constipation, daily increasing weakness, and so forth.

Symptoms of Cardiac Dropsy.—Disease of the mitral or aortic valves in the heart is the most common cause of cardiac dropsy. The injured valve, sooner or later, interferes so much with the circulation that serious disturbances become manifest. At first, perhaps, there is only shortness of breath on going up a steep flight of stairs, or other active exertion, with some palpitation and debility, but after a few weeks or months the feet and ankles may begin to swell, the skin putting on a peculiar white and glistening appearance. As the effusion extends upward rest in the recumbent posture becomes impossible, and even in the sitting position only unrefreshing snatches of slumber can be obtained. The heart's action grows daily more and more embarrassed, the lungs more or less congested and a frothy expectoration sometimes streaked with blood appears.

Further Symptoms.—In the variety of general dropsy, which proceeds from disease of the liver, serous effusion into the cavity of the abdomen is the most prominent symptom. Whether the original hepatic disorder is congestion or hypertrophy of the liver, cancer, contraction or chronic hepatic inflammation, the dropsical symptoms usually commence with exudation of fluid into the abdominal cavity from the surface of its lining membrane, the peritoneum. Dropsy of the feet and legs, however, subsequently sets in.

Acute General Dropsy.—Acute general dropsy from disease of the kidneys, or acute inflammatory dropsy may arise when the functions of the skin are suddenly suppressed, thus allowing certain morbid materials to accumulate in the blood and so set up inflammation in the secreting tubes of the kidneys. Typical examples of this form of dropsy are seen when, from exposure to cold, the action of the skin is checked during the stage of desquamation of scarlet fever, compelling the kidneys to remove the scarlatinal poison from the system when it seems to be particularly obnoxious to the renal tissues. In such cases the urine either gradually or all at once becomes scanty, dark brown in color, and on being tested by boiling is found to be loaded with albumen.

Diagnosis.—The diagnosis of dropsy is usually made with ease, by the fact that the indentation produced on firm pressure with the finger upon the enlarged foot remains for a minute or so before it is filled up by return of the watery fluid into the connective tissue. This evidence of the existence of dropsy is most conclusively obtained when the test is applied over some bone which naturally lies only a little way beneath the skin, as for example, the breast-bone or the shin-bone.

Treatment.—1. The treatment of dropsy, either local or general, involves measures indicated by the diseases which stand in a causative relation to the dropsy. Exclusive of these indications it is often an object of treatment to effect either removal or diminution of the dropsical accumulation. Remedies which produce watery evacuations from the bowels, and those which increase the secretion of urine are chiefly relied upon for this.

2. The liquid in serous cavities may be removed by a puncture or an incision, an operation called paracentesis or, commonly, tapping. In some

cases of dropsy of the chest paracentesis is resorted to. Tapping of the abdomen is often employed, and is in many cases useful, not only by relieving suffering but promoting recovery.

3. In cases of general edema or anasarca, if the effusion be very large, great relief is sometimes obtained by minute punctures of the lower limbs, through which the serum drains away in abundance.

4. Where the acute general dropsy is dependent upon suppression of the action of the skin and kidneys, active purgation and the use of diuretics are to be employed. Jalap and cream of tartar (ten grains of the former with three drachms of the latter) every day or two will answer well for catharsis. A strong cathartic is croton-oil. The dose is a single drop, and this will operate in many instances most violently, producing within half an hour sickness, vomiting and profuse alvine evacuations.

Diuretics.—The diuretics most satisfactory are the infusion of juniper berries (a pint daily), acetate of potash, citrate of potash, squills and sweet spirits of nitre. Colchicum is perhaps the most powerful of remedies, and we have succeeded with it in conjunction with mercurials in acting upon the kidneys in hepatic disease when no other remedy had any effect. Tonics, anodynes, and so forth, may, in visceral dropsy, be of more importance than diuretics. Of course it is desirable to lessen the accumulation of fluid, but the effects of the remedies used must be carefully observed, and one symptom must not be allowed to overshadow all the rest.

Diet.—In general dropsy attention to the diet is very important and efforts should be made to restrict the patient to the smallest amount of fluid with which he can sustain life comfortably. With respect to the nicer question of food, dry articles of food should be selected. It must be varied with the nature of the dropsy and the symptoms with which it is attended, and whoever understands the meaning of a phlogistic (inflammatory) and antiphlogistic (opposed to inflammation) regimen will know how to apply either of these, or to vary from one to the other, as circumstances may require.

For general dropsy:

℞.—Powdered jalap	20 grains
Cream of tartar	3 drachms
Powdered ginger	5 grains

To be taken at one dose before breakfast, two or three times a week.

Dropsy of kidneys:

℞.—Chloroform	2½ drachms
Tincture digitalis	1 drachm
Infusion of buchu	4 ounces
Water	4 ounces

Take a teaspoonful every three hours.

Heart dropsy:

℞.—Bicarbonate of potash	3 drachms
Citrate of iron and ammonia	1 drachm
Tincture of digitalis	40 drops
Infusion of buchu	4 ounces
Water	4 ounces

Take a teaspoonful every three hours.

BRIGHT'S DISEASE.

Albuminuria, dependent upon structural change in the kidneys, or to speak more correctly, disease of the kidney, characterized by albumen and dropsy.

Causes.—It is a grandular disease of the cortical part of the kidney which gives occasion to the secretion of urine, which contains albumen and is of less specific gravity than natural, and which destroys by inducing other diseases. It is one-third more common in males than in females. It mostly occurs between the ages of forty-five and sixty-five. Acute Bright's disease is most often produced by cold and dampness, next by scarlet fever, pregnancy, or violent intemperance. The chronic form is greatly promoted by exposure to cold and wet, and is caused moreover by abuse of spirituous liquors. Other predisposing causes are gout, constitutional syphilis and affections of the bladder and urethra.

Acute Bright's Disease.—After exposure to cold, or a drunken fit, or scarlet fever, the patient is seized with chilliness, headache, nausea, vomiting, pain in the back and limbs, checking of perspiration and oppression in breathing. Fever follows and the face, trunk and limbs become puffy with anasarca. Effusion may also occur in the pleura or peritoneum. The urine is scanty, heavy and dark in color from the presence of blood and very albuminous. The disposition to void it occurs more frequently than in health. The deposit from it, under the microscope, shows blood-corpuscles, loose renal epithelium, tube-casts and shapeless masses of fibrin. After one, two or three weeks, or even a longer period, the attack proceeds to one of three terminations, recovery, death or lapse into the chronic state. Death results through uremia, secondary pneumonia, pleurisy, peritonitis, hydrocephalus or ascites. Probably two-thirds or more of the cases in the acute form recover.

Treatment.—Cupping the loins, hot water or hot air or "blanket bath," active purging, as with cream of tartar and jalap, or citrate of magnesium, and diaphoretics, as citrate of potash or liquor ammonia acetatis.

Diet.—Should be liquid and simply nutritious.

Chronic Bright's Disease.—This approaches so slowly as seldom to be detected until after the lapse of months or years. Gradual loss of strength, pallor or puffiness of the face, shortness of breath and frequent disposition to urinate are early signs of it. But they are not always present; the denouement of the disease may be by a convulsion, edema of the lungs, dimness of vision, or some violent local inflammation.

Symptoms.—Albuminous urine, deposits of tube-casts and renal epithelium, dryness of skin, frequent micturition, especially at night; general dropsy, or local effusions into the cavities, indigestion, anemia, uremic effects (headache, dizziness of sight, convulsions, coma, vomiting, diarrhea), enlargement of the heart and secondary inflammations, bronchitis is especially common. The progress of the case is usually interrupted by exacerbations and intervals; each fresh attack leaving the patient manifestly worse than before.

Diagnosis.—The presence of albumen in the urine, with dropsy, not of sudden origin or brief duration, is indicative of this affection. The microscope will show also free renal epithelium and tubular casts in the urine; in advanced cases the casts are sprinkled with oil-dots.

Treatment 1.—Iron will do more good than any other medicine, unless it be cod-liver oil in persons of strong stomach. They may be very well combined. The tincture of the chloride of iron is as good as any other chalybeate as a general rule. With some the citrate of iron in solution, or a carbonate, or the iodide, will agree more readily. As an astringent the ammonia-ferric alum is claimed to possess the power of checking the waste of albumen through the kidneys.

2. For the dropsy warm baths and hydrogogue cathartics are useful. Of the latter cream of tartar and jalap, two or three drachms of the bitartrate with ten or twenty grains of jalap two or three times a week, are the favorites. If serious dropsical accumulations threaten life, elaterium (one-sixth or one-fourth-grain every four hours, in pill, until it acts) may be given.

3. If the warm baths do not agree or fail to produce diaphoresis try the hot-air bath, at 130 degrees to 150 degrees Fahrenheit. This rarely

fails to produce free perspiration. For weaker invalids the vapor bath is available. Of diuretics, acetate of potassium, spirits of nitrous ether, and compound spirit of juniper will be least likely to disappoint.

4. But all will not unfrequently fail. We have as a last resource for the relief of great edema the use of incisions with a lancet or needle in the swollen legs and feet. Care should be taken that erysipelas does not follow, by repeated warm sponging of the limbs and washing them with diluted glycerine.

Diet.—Nourishing diet, of which milk may generally be part, is of the utmost consequence. Regimen or hygienic management is of the utmost importance. Avoidance of exposure to cold, wet or great fatigue; the reform of intemperance, if it has existed, or all other excesses, will be indispensable. Clothing should be sufficiently warm, with flannel next to the skin. Bathing frequently at such temperatures as is borne without either chill or relaxation, and the bowels should be kept regularly open.

The following are approved remedies:

℞.—Chloride of soda and gold	3 grains
Corrosive sublimate	5 "

Extract of gentian sufficient to make 60 pills.

Take one morning and night.

℞.—Iodide of soda	15 grains
Phosphate of soda	½ drachm
Common salt	3 drachms

Water sufficient to make solution.

Divide into three equal parts, and take one part every eight hours.

CURATIVE MEDICINE.

PART III.

NERVOUS DISEASES.

Division of Nerves.—1. Motor nerves or those in which irritation produces muscular contraction.

2. Sensitive nerves, or nerves of common sensibility, in which irritation is followed by an agreeable or painful feeling, according to the nature or degree of the stimulation.

3. Nerves of special sense in which irritation excites the peculiar sensations of light, sound, taste, etc. Many sensitive nerves arise from nervous centres in such close proximity to motor nerves that a stimulus applied to the former will react upon the latter and produce not only a direct sensation, but what is technically called a reflex action. It is a remarkable fact that whatever part of a sensitive nerve be irritated, whether it be the centre, the middle, or the extremity, the same sensation will be produced.

Nature of Nervous Force.—We can judge of the nature of the nervous force only by its effects. The muscular contraction caused by the irritation of a nerve is due to the development of a peculiar vital force in the nerve structure, which is unlike any of the known physical forces. It bears certain analogies to electricity.

1. The identity of their effects on muscular fibre.
2. The rapidity of their action without producing any appreciable effect on the parts between the point of irritation and the point affected.
3. The extreme sensibility of nerves to the electric current.
4. The phenomena of electrical fishes.

SOFTENING OF THE BRAIN (Ramollissement).

Peculiarity.—It is the consequence of chronic or acute inflammation, or it may occur from obliteration of the arteries.

Softening of the mucous membrane of the digestive organs is of much more frequent occurrence than softening of the brain.

Causes.—Two causes appear to coöperate in producing softening of the brain. The first is of a mechanical, the second of a physiological nature. Serosity, or pus, when in considerable quantity, appear to effect, mechanically, a diminution of the cohesion of the tissue in which they are contained. The pressure which they exercise arrests the circulation, and it would appear absorption also; for if this function were performed we should have an excavation or ulcer formed instead of a mass of soft pulpy tissue. The circulation being thus arrested nutrition ceases to be accomplished and the molecules of the tissues are disunited and detached. If while these changes are going on, or at some subsequent period, the function of absorption be resumed, the softened tissue is partially or wholly absorbed and solutions of continuity of various extent are formed. The physiological cause, therefore, of softening is referable to a change in the vital properties of the affected tissue.

Degree of Softening.—The degree of softening of the cerebral substance may vary from a slight diminution of the natural consistence of the part to that of cream or even of thin milk. The first stage of softening of this substance is often so slight that it is hardly perceptible to the touch, and may, even when considerable, if not accompanied by some peculiarity of color, be altogether overlooked.

Physical Characters.—The color of inflammatory softening of the cerebral substance presents considerable variety, dependent on the quantity of blood contained in the affected part. Redness and vascularity are, in general, greater in the first than in the second stage, but the degree and extent of either greatly depend on the quantity of blood in the cerebral vascular system. When the redness which accompanies softening arises from the presence of effused blood it may always be regarded as evidence that the softening is of recent occurrence.

Other Evidences of Softening.—But there are other modifications of color which accompany softening of the cerebral substance. They indicate that the disease has existed for a considerable time, several weeks, or two or three months. The principal modifications of color consist of brown, yellow and orange, either separately or combined, and occupy either the softened substance, the part of the brain contiguous to it, or both at the same time. They are not observed unless the softening has been accompanied by effusion and originate in changes taking place in the effused blood.

When Softening May Occur.—Softening may occur in the brain and medullary substances at the same time. It may also occupy several portions of the brain at the same time, as the septum lucidum, fornix and walls of the lateral ventricles, the corpora striata and thalami, one or more lobes, a portion of one or both hemispheres, the brain and cerebellum, and is rarely met with in the latter organ without its being present in the former. Circumstances which give great variety and complexity to the functional derangement by which it is accompanied.

Symptoms.—As the symptoms of the first period of inflammatory softening of the brain must necessarily be those of inflammation of this organ, it would be superfluous to describe them here. It may, however, be observed that the severity of these symptoms does not always indicate a corresponding condition as to the extent of the softening which they precede, nor do they present any one character which can be regarded as a sign that the inflammation on which they depend will terminate in softening. When, however, they are taken in conjunction with those of the second period, they are frequently of great value as they afford us the means of establishing our diagnosis in cases where it would be otherwise impossible.

Symptoms of Second Period.—The symptoms of the second period of inflammatory softening of the brain are of an entirely opposite character to those of the first period. Those of the first depending on the presence of irritation, or a morbid stimulus, are characterized by a state of excitement; whereas those of the second being the consequence of the softening or disorganiztion of the cerebral substance, are necessarily marked by a state of prostration, collapsus or paralysis. They are announced by the gradual or sudden diminution of the intellectual powers, by the occurrence of stupor or coma, by paralysis, difficulty or loss of speech and diminution of the sensibility of the skin, eye and ear. The relative frequency, degree and extent of these symptoms, as well as the order of their occurrence, present considerable variety. Thus, the derangement of the intellectual faculties, such as their diminution, suspension or abolition, is always present at the commencement of the second period, that is so soon as the softening of the cerebral substance has taken place. In some cases the derangement which they manifest is at first slight, increases gradually or rapidly and terminates in their entire abolition. In others these faculties are, from the commencement, gravely compromised and give no signs whatever of their existence.

Peculiar Symptoms.—It is not rare to meet with cases in which their derangement is marked by remissions and exacerbations, or the occurrence of lucid intervals succeeded by profound stupor. The delirium which accompanies the first period of inflammatory softening either disappears or diminishes greatly in intensity when the second period is announced by the derangement of the intellectual faculties to which we have alluded.

It diminishes with the diminution of these faculties and ceases when their suspension or abolition is indicated by the presence of coma and complete paralysis.

Loss of Memory.—An imperfect state or the entire loss of memory and speech are necessary consequences of these latter conditions of the intellectual faculties. But the absence of any derangement of these faculties is not necessarily unaccompanied by derangement of memory and speech, particularly the latter, for a patient may recover the consciousness of his existence, perceive and comprehend what is passing around him, and yet be incapable of expressing himself in words on account of paralysis of the muscles by means of which the act of speech is accomplished. The diminution, suspension or abolition of the intellectual functions are always accompanied with paralysis of the muscles of voluntary motion, and the degree of the paralysis is, generally, in the direct ratio of the extent of the derangement manifested by these functions.

Brain Paralysis.—The paralysis is rarely complete at the commencement. It is generally progressive with occasional alternations of increase and decrease before it becomes ultimately complete. The situation and extent of the paralysis present considerable variety and in many cases seem to correspond with the situation and extent of the softening, in the same manner as in apoplexy. The paralysis occupies one or both extremities of the same side when the softening is limited to one of the hemispheres of the brain, and paraplegia or universal paralysis is produced when both hemispheres, the pons varolii, etc., are the seat of this lesion. Paralysis occurs more frequently in the superior than in the inferior extremities; the seat of the lesion of the former being in the corpus striatum, and of the latter, the optic thalamus of the opposite side of the brain.

Paralysis of Face Muscles.—Paralysis of the muscles of the face, of the eye, of the tongue and of deglutition, depends likewise in the situation of the softening. Paralysis of the bladder and rectum is a frequent occurrence of softening of the brain, and gives rise, in the first place, to an accumulation of the contents of these organs, and afterward to their involuntary escape, more particularly of the urine, from the distension of the bladder and the subsequent dilatation of its sphincter. It is under similar circumstances of the brain that the organs of hearing and of sight, which in the first inflammatory period of softening are highly susceptible, are rendered obtuse to a degree that a strong light or loud sounds impressed on the eye and ear pass unperceived.

Permanent Muscular Contraction.—One of the most constant symptoms of inflammatory softening of the brain is a state of permanent contraction of the flexor muscles of the extremities.

The last symptom which we shall notice is that of pain. This does not depend on the state of softening of the cerebral substance. It is the consequence of irritation or morbid excitement of the brain, the disorganization of which has not yet taken place. It is generally most severe when it occurs as a precursory symptom, but it frequently accompanies the first period of the disease, and presents remissions and exacerbations, variable in duration and degree.

Treatment.—There are no successful cases recorded of softening from obliteration of the arteries, and in the few cases of the inflammatory forms of the disease, which have terminated favorably, it is more than probable that the softening was very limited in extent and affected the superficial or less important parts of the brain. As regards the state of softening, which, in point of fact, consists in a solution of continuity of the cerebral substance, it must be obvious that we possess no remedial agent capable of obviating such a change. The diseased state, therefore, of which we are treating, is incurable; that is to say, the solution of continuity of which it consists will remain, even though the patient should recover. The essential part of the treatment of softening of the brain relates, consequently, to the local morbid conditions which immediately precede this change, viz.: the diseased state of the arteries on the one hand and inflammation of the brain on the other. This state of the arteries, like the softening to which it gives rise, is so far as we yet know, beyond the control of remedial agents. When, therefore, it is ascertained that the softening is the consequence of this state of the arteries, the only hope that can be indulged is partial relief, and the prolongation of life for a short period beyond that at which the disease would have proved fatal had it been allowed to run its natural course.

Staying Treatment.—It is possible that the attack may be delayed by judicious treatment, employed when the first symptoms of cerebral derangement are perceived, such as pain in a particular part of the head, confusion of ideas, giddiness or unusual drowsiness and listlessness, together with a prickling sensation or numbness in the muscles of the extremities, face or tongue.

Further Treatment.—Bleeding from the temples, cupping in the nape of the neck, or small general bleedings, repeated from time to time as circumstances may require, may, by diminishing the quantity of the blood, facilitate the circulation of this fluid through the brain. But, perhaps, the greater advantage would be derived by keeping the bowels freely open

THE BRAIN.

Figure No. 1.

1,1,1,1. Motor track delineated from the front columns of the spinal marrow to the hemispheric ganglion.
2. Pyramidal body.
3. Eminences in the medula oblongata.
4. Variolus bridge.
5. Legs of the brain.
6. Streaked body.
7. Hemispheric ganglion.
8. Cerebellum.
9. Olfactory nerve.
10. Optic nerve.
11. Fourtn pair of nerves.
12. Sensory root of the fifth pair.
13. The seventh and eighth pairs of nerves.
14. Front suture.
15. Mammillary elevation.
16. Corpora geniculatum.

Figure No. 2.

1,1. Section of the callous body.
2. Transparent partition.
3. Front column of the vault.
4. Section of front suture.
5. Central substance of the chamber.
6. Sylvius' aqueduct.
7. Pineal gland.
8. Medullar band which extends from the pineal gland to the front suture.
9. Section of the legs of the brain.
10. One of the white bodies, or mammillary bodies.
11. Gray excrescence.
12. Section of the intricacy of the optic nerves.
13. Optic nerve beyond the intricacy.
14. Olfactory nerve.
15. Front surface of the hemisphere.
16. Fissure between the back and middle lobes of the brain.

Figure No. 3.

1. Front extremity of the fissure of the brain.
2. Back extremity.
3. Front lobes of the brain.
4. Middle lobe.
5. The sylvius fissure.
6. Back lobe.
7. Infundibulus point.
8. Its body.
9. White or mammillary bodies.
10. Ash-colored matter.
11. Legs of the brain.
12. Variolus' bridge.
13. Upper end of the medulla oblongata.
14. Back prolongation of the variolus bridge.
15. Middle of the cerebellum.
16. Front part.
17. Back part.
18. Upper part of the spinal marrow
19. Middle fissure of medulla oblongata.
20. Pyramidal body.
21. Rectiform body.
22. Oval body.
23. Olfactory nerve.
24. Its bulb.
25. Its external root.
26. Its middle root.
27. Its internal root.
28. Optic nerve beyond the intricacy.
29. The same before the intricacy.
30. Motor of the eye or third pair.
31. Pathetic nerves or fourth pair.
32. Trigeminus or fourth pair.
33. External motor or sixth pair.
34. Facial nerve.
35. Auditive nerve.
36,37,38. Eighth pair.

Figure No. 4.

1. Vertical section of the head.
2. Frontal cavity.
3. Greater *falce* of the brain.
4. Its origin from the rooster's comb.
5. Its union along the sagital suture.
6. Under or concave edge.
7. Counteraction to the cerebellum store.
8. Cerebellum store.
9. Union to temporal bone.
10. Free edge of same.
11. Tortuous elevations of the front right lobe of the brain.
12. Front extremity of the callous body.
13. Transparent partition.
14. Section of the front suture.
15. Front parts of the vault.
16. The middle of same.
17. Back end.
18. Inner side of the bed.
19. Section of streaked bodies.
20. Side walls of the third ventricle.
21. The dura mater, turned upside down.
22. Section of the internal carotid artery.

Figure No. 5.

1. Front lobe of the brain.
2. Back lobe.
3. Middle lobe.

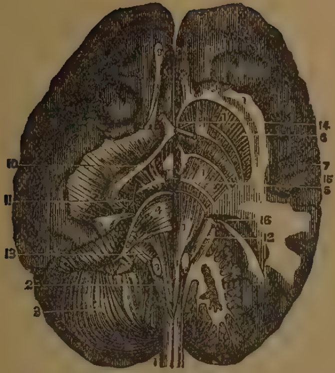


FIG. 1.—View of the course of the front columns of the spinal marrow terminating in the hemispheric ganglions of the brain.

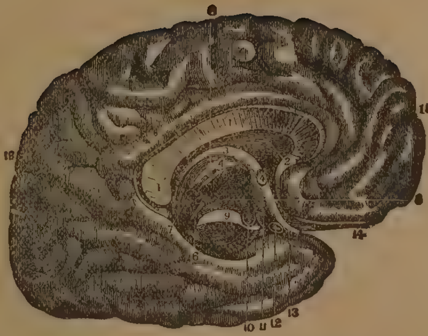


FIG. 2.—Middle vertical section of the callous body. The inner left side of the brain is also seen.

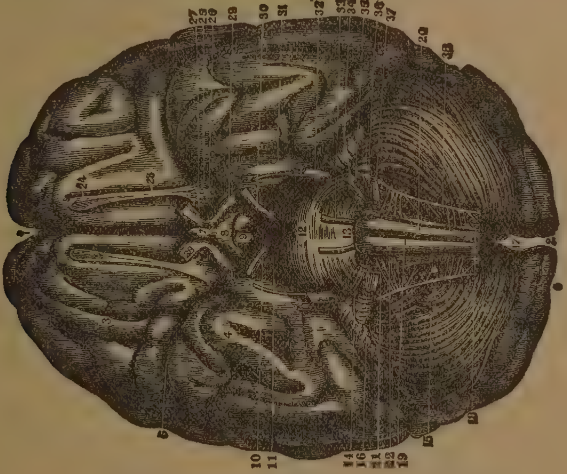


FIG. 3.—View of the base of the brain and cerebellum, together with the nerves.

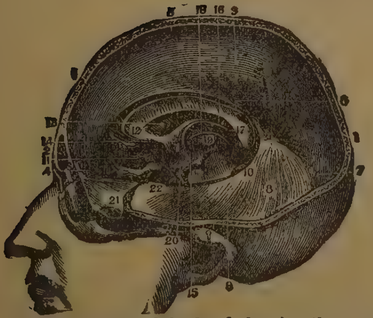


FIG. 4.—Section of the head showing the greater scythe, the horizontal apophysis of the dura mater between the brain and the cerebellum and other parts found under the middle line of the head.

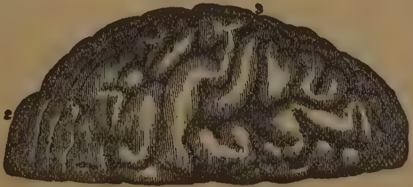


FIG. 5.—View of the appearance of the tortuous elevations of one side of the brain, seen from above.

THE BRAIN.

For an explanation of the illustrations see text on opposite page.

without inducing excitement or debility, chiefly by means of the neutral salts. The compound aloetic pill will be advantageously employed in those cases in which the disease occurs after the cessation of the catamenia, or suppression of a hemorrhoidal discharge. A diminution of the circulating fluids, as well as their equalization, will be effected likewise by promoting all the secretions, particularly those of the urine and bile.

Diet.—The food and drink of the patient should be particularly attended to. His diet should consist of those kinds of food which are most easily digested, and which afford the greatest quantity of nourishment in the smallest bulk. Ardent spirits, strong wines, fermented liquors, even strong coffee or tea and all stimulants should be avoided as more or less injurious.

Treatment of Second Period.—The treatment of the second period, or that of softening from inflammation, is the same in principle as that of the former, in so far as it regards the state of excitement with which this morbid change is generally accompanied. But if the paralysis be fairly established and, notwithstanding the depletory and sedative measures which have been employed, continues to increase, neither our own observation nor the recorded experience of others would recommend a steady perseverance in the means, the debilitating effects of which have not been sufficient to overcome the inflammatory excitement of the first period. Bleeding and active purgatives should now be laid aside; blisters or sinapism should be applied to the inferior extremities, the nape of the neck and superior part of the spine; the head should be kept cool by the constant application of evaporating lotions; the bowels evacuated once or twice a day by means of a mild aperient, or by injections, the secretion of urine and the cutaneous perspiration should also be promoted by remedies of the least stimulating qualities. The retention of the urine is a complication which must be sedulously watched, that this fluid may be removed before it accumulates to a degree to prove injurious; stimuli or tonics should now be employed with a view to support the strength of the patient, but they ought never to be employed to such an extent as to produce excitement, as the powers of life are already greatly exhausted by the stimulus of the disease.

BRAIN FEVER.

(*Cerebral Macula.*)

Difficult Diagnosis.—Under this term we propose to include the pathology, symptoms and treatment of the inflammatory affections of the brain and of its membranes. We adopt this plan, not merely because of the intimate relation subsisting between these structures, but because, when we trace the history of a number of acute affections of the encephalon and examine the lesions of structure presented after death, we shall frequently find that the substance of the organ, as well as the investing membranes, has been involved in the disease. Hence arises the difficulty of establishing the diagnosis between inflammation of the parenchyma of the brain and that of its membranes.

Symptoms.—When either the arachnoid or pia mater, which closely invest the brain, are extensively inflamed, the functions of this organ become inevitably disturbed by sympathetic irritation, without its parenchyma necessarily partaking of the inflammation, or if the inflammation extends to the parenchyma it is mostly confined to the superficial layer of cortical substance. Hence meningitis, beside headache and intense fever, we have an increase of the general sensibility, preternatural acuteness of the external senses, violent delirium and convulsions, and, finally, collapse, coma and death. Extensive and acute inflammation of the hemispheres of the brain will be characterized by a nearly similar train of symptoms.

Two Classes of Inflammation.—We shall proceed to consider inflammation of the encephalon under two divisions, viz.: 1. Inflammation of the membranes of the brain (meningitis); 2. Inflammation of the substance of the brain (cerebritis).

Inflammation of Brain Membrane.—An examination of the structure of the brain and of the peculiarities of the circulation in it and upon it would lead us to the inference that if the meninges be the seat of inflammation, the contiguous cerebral substance must participate in some degree in the irritative influence. In other organs the vessels, after entering them by trunks and branches of various sizes, branch out and ramify in their interior until they become capillary in their spongy and areolar tissue. But in the brain a different arrangement takes place, the vessels, after entering at the base of the skull, communicate freely with one another and then branch out upon the surface of the brain, ramifying in an extended web or cellular tissue (pia mater); in this way they become reduced to so great a degree of tenuity before they enter the substance of the organ that it may be said to be surrounded by a vascular atmosphere from which its supplies are derived. Hence it is, that as the meninges and the contiguous cerebral substance are supplied from the same source, each will more or less become affected by any inflammatory action set up in the other.

Sympathetic Symptoms.—Cerebral irritations are divisible into two great classes, symptomatic and idiopathic. Symptomatic irritation is for the most part connected with and dependent as a morbid condition of the chylopoetic viscera. We frequently observe that for weeks previously to the occurrence of pain or any disturbance in the head the digestive functions have been impaired, the bowels confined or irregular and the stools unnatural. In many of these cases, when the headache, retching, irregular fever and even coma have set in, speedy and permanent relief has followed the use of purgatives, and the other means usually resorted to for correcting disordered functions. An irritative influence is in such cases propagated from the digestive organs to the brain by reason of the close sympathetic connection which subsits between them in health and in disease, and that irritation, if kept up for a while, will pass into positive inflammation, marked by its usual consequences. The irritation of worms and of teething may also induce similar results, more particularly in those constitutionally predisposed. We frequently observe these cerebral affections to spring up during the course of other diseases, of which they may be considered as complications, viz.: continued fever, scarlatina, measles, whooping-cough, and they not unfrequently follow accidents or injuries.

Varying Symptoms.—This affection presents a train of symptoms which varies in different ages and in different temperaments. Its most marked and ordinary character at its outset is an increased sensibility to all sorts of impressions, the ordinary external influences producing inordinate effects. Thus, a child is restless and sleepless, seldom even dozing, or if he does doze from time to time starting and waking up; he attends to every sound, the eyes are suffused, the retina is so sensitive to light that he winks or turns away if his face is directed to a window or to a light; the pupil is generally contracted but not invariably so. The head is often moved about or from side to side, so are the limbs; the temper is peevish and nothing seems to soothe this irritable condition but motion up and down the room in the arms of the nurse or attendant.

Bowel Symptoms.—The state of the bowels varies much in different instances, they may be confined or relaxed, but the stools do not present any unnatural appearance.

Increased Animation.—There is a minor degree of this state which is marked by increased animation and liveliness, which with ordinary observers may pass for an increase of health and vigor, though an attentive observer will readily perceive that the countenance wants that disengaged air which exists in health, and on making a closer examination he will find that the eyes frequently close and wink and the countenace assumes an expression as of frowning; the hand, too, is frequently raised toward the head, and the fingers are fixedly closed.

Indifference.—We occasionally observe a state the very opposite of this, a state characterized by want of animation, accompanied by plaintive moaning at times, and an indifference to surrounding objects. Though the patient does not sleep, yet his state is not that of waking, and if roused, betrays fretfulness and peevishness. These may be considered as so many indications of an incipient irritation, which in some constitutions may arise independently of any assignable agency, but which in many cases is referable to an irritation propagated to the brain from the peripheral extremities of the nerves during dentition, or by worms in the alimentary canal, or by vitiated secretions, or a torpid liver.

Fever Symptoms.—The symptoms above indicated are by some denominated fever, some epithet being usually added for the purpose of indicating its source, or its nature; hence the terms gastric, irritative and hydrocephalic fever.

Morbid Excitement.—The most expressive term which we can employ is that of "sensitive erethism," or morbid excitement. It is distinct from inflammation of the brain, of which it is frequently the precursor, and according to individual peculiarities, or other modifying circumstances, it may end in cerebritis, meningitis or that modification of the latter called hydrocephalus, and this termination is but too often unexpected by the practitioner, whose attention has perhaps been directed to secondary indications and minor effects, while the erethismal state of the brain has crept on unheeded. The condition here indicated cannot be supposed to exist unaccompanied by an increased flow of blood through the cerebral vessels, or in other words, an increase in their degree of tension; and as the tension may vary from a slight degree of fullness to the greatest of which the vessels are susceptible, such a state of local determination of blood will soon end in inflammation if not subdued by proper means.

Further Symptoms.—The actual inflammatory attack is generally ushered in by headache more or less violent (the pain being referred to the temples, the vertex or forehead, sometimes to the occiput and base of the skull), by intolerance of light, heavy and suffused eye, with quick pulse, are also attendants; so, in many instances, is vomiting. In those who have suffered much from mental disquiet spasmodic twitchings are sometimes perceived, not unlike those which arise from slight electric sparks. In children and very young persons it frequently commences with a sudden and long-continued convulsion without any previous warning. After a while the convulsive movements cease, a remission takes place and the patient appears free from complaint for one or more days, when a second attack occurs which may terminate in coma and death.

Changes in Membrane.—After having been the subject of inflammation the membranes present various changes dependent either on the duration and intensity of the attack or on the frequency of its recurrence; but all of them are referable to the following heads, viz.: simple redness of the arachnoid; thickening and opacity with increased firmness; serous effusion beneath or upon it or into the ventricles; puriform or sero-purulent exudations; false membranes; increased vascularity and thickening of the pia mater. We also find lesions consisting of granulations scattered in the meninges over the surface of the brain and in the sylvan fissure, which have been shown by the microscope to be of a tubercular nature.

CHRONIC MENINGITIS.

The Delirium.—Meningitis is in many instances so slow in its progress as to assume the chronic form. We have then delirium and progressive paralysis as constant attendants. The delirium is at first partial, it is a monomania with weakness of intellect, but, after a time it passes on to maniacal excitement and finally subsides into confirmed idiocy. The paralysis in those cases does not exhibit a total privation of sensation and motion in any particular part of the body; it is at first slight, but gradually increases and extends to the whole muscular system, rendering the gait feeble and vacillating and ultimately destroying the power of motion. It is remarkable that the diminution of sensation is not proportioned to that of motion. Spasmodic movements with contraction and rigidity of the limbs sooner or later set in, and, finally, epileptic attacks, which terminate in fatal apoplexy.

The Paralysis.—The paralysis which occurs presents this remarkable feature, that it seems to shift about from one hour to the other, one day, for instance, the right leg is found to be drawn up with greater energy than the left, when the sole of the right foot is tickled, but on repeating the examination a few days afterward it is the left leg which now feels and moves better than the right. It would seem from this as if the paralysis had shifted from one side to the other, but such is not the case, the limb which was first palsied is still so, but the illusion arises from the circumstance that the palsy has not increased in degree in the first limb, while the second limb has become involved to a greater degree. Motor power has not returned in the former, but has been more gravely impaired in the latter.

After-Death Facts.—The lesions which are found after death subsequently account for these facts. When the right limbs alone were paralyzed the brain is found to be disorganized on the left side; but when the paralysis apparently shifted from one side to the other both hemispheres are found diseased, but more deeply and more extensively on the opposite side to that of the limbs which were most palsied. This apparent mobility of paralytic symptoms more frequently occurs in meningitis than in any other complaint.

Causes.—Meningitis is a frequent consequence of injuries of the head, of fractures, concussion or even wounds of the scalp. It not infrequently happens that a wound of the head heals rapidly and that the patient returns to his usual occupation thinking himself quite well, but after ten or fourteen days he begins to feel pain in the situation of the wound which gradually increases in intensity, and in a very short time all the symptoms of cerebral inflammation become manifest. A child may suffer serious injury from a fall, and as all mention of the accident is suppressed by his immediate attendant, it escapes the notice of others and no ill effects follow perhaps for a week or two; the child then, however, loses appetite, becomes restless and irritable, febrile excitement, delirium and convulsions succeed and too often are the precursors of a fatal termination.

INFLAMMATION OF BRAIN SUBSTANCE (Cerebritis).

Symptoms.—The most usual premonitory symptoms are a general uneasiness and restlessness with a tendency to congestion in the head; a sense of weight and fullness; occasional attacks of pain in the head, or of temporary apoplexy or epilepsy; flushing of the face and increased heat of the head; drowsiness and vertigo; preternatural acuteness of the external senses; intolerance of light and optical illusions; contraction of the pupils, strabismus or imperfection of sight; tinnitus aurium or various other noises in the ear; confusion of thought; failure of the memory; mental excitement or depression, or some striking alteration in the habitual character and pursuits of the individual.

Additional Symptoms.—In some cases there is little appearance of indisposition throughout the day, but the symptoms are aggravated at night; the sleep is uneasy or disturbed by alarming dreams, and in children there is often grinding of the teeth. Pains in the limbs and frequent cramps, general lassitude and muscular debility are often felt, alternating with fits of shivering and feverishness; the digestive functions are disordered; there is a general loss of appetite; often obstinate vomiting; the bowels are either irritable or torpid, the secretions being always unhealthy.

Symptoms Following Inflammation.—The above symptoms precede either general or partial inflammation of the brain. Those which follow indicate more especially the invasion of partial and chronic inflammation, a long-continued, fixed and deep-seated pain in one part of the head; pain, numbness, weakness, a sensation of creeping and tingling in one extremity or in one-half of the body, or confined to one portion of the extremity; there may be numbness and loss of power in one finger only or in one set of muscles. Sometimes the speech is affected so as to produce a degree of hesitation, stuttering or indistinctness of pronunciation, drowsiness, languor, depression of spirits are observed, also more particularly in the chronic form of cerebritis. Some of these premonitory symptoms may have been present for weeks, for months, or even for a year, or for a longer period.

General Cerebritis.—General cerebritis is always acute. Its symptoms are divisible into two periods, viz.: 1. The period of irritation or excitement. 2. The period of collapse.

Symptoms.—The symptoms which characterize the period of excitement are intense pain extending over the greater part of the head; great excitement of the cerebral functions; violent dilirium; preternatural acuteness of both the external and internal senses; intolerance of light; brightness, redness, wildness or protrusion of the eyes; contraction of the pupils; tinnitus aurium; flushing of the face; throbbing of the temporal arteries; paroxysms of general convulsion; rigidity of some of the muscles on one or both sides of the body in the interval of the paroxysms. There are also severe shooting pains in the extremities, greatly increased by extending them; twitching of the muscles of the face; rolling of the eyes; quick, suspicious and irregular breathing; rapid, full and hard pulse; subsultus tendinum; red and dry tongue, either tremulous when protruded or in violent motion, pushing out the cheek or forcibly thrust out of the mouth; great thirst; occasionally severe vomiting, especially in children; scanty and high-colored urine. The paroxysms of convulsion are always attended with an exacerbation of the symptoms. The respiration is hurried, and the pulse rises suddenly, forty or fifty beats in a minute. When the convulsions subside the pulse and respiration become comparatively slow and feeble.

Further Symptoms.—The symptoms just enumerated may last from twelve to forty-eight hours or more, when they are succeeded by others of an opposite character, which constitute the second period or that of collapse. The headache is now no longer complained of; delirium gradually passes into stupor or coma; the preternatural acuteness of the senses is succeeded by obtuseness and insensibility; the convulsions subside into general muscular relaxation and more or less complete paralysis succeeds

The pupils become dilated and motionless; the eyes sunk, pale and dim; there is sometimes strabismus or deafness; the pulse is rapid, small, unequal or intermittent; there are frequent rigors, the skin afterward feeling cold and covered with a clammy sweat; the face is pale, sunk and cadaverous; the respiration is slow or irregular and stertorous. When the patient lies senseless on his back and swallows with difficulty, the fatal issue is not far distant. There may be several alternate paroxysms of excitement and collapse until the patient finally sinks into a state of coma, which soon ends in death.

Diagnosis.—When the inflammation occupies at the onset a large portion of the brain, it is generally complicated with meningitis and characterized by disturbance in all the vital functions.

Course of the Disease.—When, however, a smaller portion of the brain is engaged in inflammation the course of the disease is seldom so rapid; its invasion is more gradual and preceded by symptoms of irritation in some of the organs of voluntary motion, sensation or intelligence. Convulsive rigidity and retraction of the muscles are sometimes observed in connection with meningitis; but it may be generally distinguished from spasmodic paralysis by several well-marked signs. There is no actual paralysis, and when the convulsive retraction intermits the patient fully recovers the power of voluntary motion in the same manner as after the paroxysms of spasmodic rigidity in tetanus. This convulsive rigidity is scarcely ever limited to one region or to one side of the body as in partial cerebritis, but affects a variety of parts at the same time on both sides.

Treatment.—The inflammatory nature of the more acute forms of cerebritis and arachnitis is so obvious that their treatment has always been conducted in correct principles. Until very lately, however, the inflammatory character of partial and chronic cerebritis was either entirely overlooked or imperfectly understood, that though active treatment was sometimes adopted at the beginning of the disease it was soon laid aside, and remedies of an opposite description substituted. These affections were in fact generally set down as nervous, mistaken for rheumatism, neuralgia, nervous dyspepsia and debility or nervous palsy, and treated by tonics, electricity and stimulants; the fatal termination of the disease being thus accelerated.

Preventive Treatment.—Cerebritis and arachnitis are so formidable that their prevention is of no less, if not greater importance, than their treatment. It is extremely important to have recourse to active measures on the very first appearance of any of the premonitory symptoms, however trifling; as we may thus succeed in effectually removing that state of congestion and irritation of the brain, which is the precursor of inflammation. The means of accomplishing this are the careful and timely removal of all the exciting causes; of every source of irritation, both bodily and mental; regulation of the diet; avoiding all excesses; relaxation from study; change of air; general and local blood letting, counter-irritation, with occasional purgatives.

Vigilance Required.—Great vigilance is particularly required in the cerebral affections of infants and children who frequently suffer without complaining. A predisposition to affection of the brain may often be suspected by some slight cost or rolling of the eyes; by dilatation of the pupils, or occasional startings or attacks of spasmodic croupy breathing during sleep; there may be every other appearance of perfect health with these symptoms, which are often only evanescent.

Relieving Congestion.—When it is necessary to relieve the brain from habitual congestion by occasional topical bleeding, the method of taking blood from parts as remote from the disease as possible seems to us preferable to that of abstracting blood from the head itself. When the vessels of a part are partially emptied of their blood, if they have been much weakened by long continued, over-distension or previous disease, so as to have lost their elasticity, there will be an immediate flow of fresh blood to the part; this will take place on mere hydrostatic principles.

Uses of Bleeding.—No fact is better established than that the loss of an exceedingly small quantity of blood from certain parts of the body is sufficient to relieve distressing symptoms of congestion and oppression in others most remote from them; as, for instance, a very slight discharge of blood (one or two ounces) from the hemorrhoidal veins being sufficient instantly to remove vertigo, flushing, headache or oppressed breathing; the same is the case in a still more striking manner with the catamenia, although some account must be taken of the influence of uterine irritation over the system. We prefer, therefore, in cases of habitual congestion in the brain, taking blood occasionally from the feet or legs, by opening a vein or applying leeches and letting them bleed in a foot-bath; or the application of leeches to the arms whenever practicable. We have found this the surest method of affording permanent relief, and by repeating it at certain intervals the tendency to cerebral congestion may be completely overcome. We have pursued this plan in lunatics with the very best results.

Cooling the Head.—The insertion of an issue is often advisible as a preventive in people of a plethoric habit. The head should be kept cool by the frequent use of cold ablutions, the hair cut short, the head and shoulders raised at night; tight bandages round the neck must be avoided; the daily use of the cold shower bath is often very beneficial, but a reaction takes place in the head unless it be used with the feet immersed in hot water. The feet, legs and lower parts of the body ought to be carefully kept warm and dry.

Further Treatment.—In the treatment of cerebritis, when fully developed, attention must be paid to its two periods of excitement and collapse. The remedies chiefly to be relied upon are blood letting, general and topical, purgatives, cold applications to the head and counter-irritation.

Treatment of More Acute Cases.—In the more acute cases the patient must be freely bled from a large orifice. If the symptoms continue unabated the bleeding must, however, be repeated several times, at intervals of a few hours, and this practice must be carried during the first period of the disease to the utmost limit of the patient's strength. It often happens that very little impression is made on the disease by the first bleeding and no amendment takes place until after the second. The symptoms often abate after bleeding, but a fresh exacerbation may take place in the course of a few hours. Topical bleeding, by cupping or leeches, is, under such circumstances, highly beneficial.

Head Treatment.—The head must be shaved, and pounded ice mixed with cold water and vinegar may be applied to the scalp. A very effectual method of applying cold is by making the patient hold his head over a basin and pouring a stream of cold water on it from a certain height; this often removes the heat and flushing and calms the excitement; it should be repeated as often as the heat and flushing return. The application of cold to the body is always followed by a reaction, and the temporary relief refrigerants afford will be succeeded by an increase of the inflammatory symptoms and their use become decidedly injurious unless their depressing action be kept up by a steady and repeated application.

Other Remedies.—The remedies next to bleeding and cold, and often not less efficacious, are active purgatives, which must be administered at short intervals until copious evacuations be procured. In some cases no marked amendment has taken place until the bowls have been freely moved; they are sometimes exceedingly torpid, for reasons which have already been assigned, and large doses of cathartics may be required. Combinations of calomel, jalap, scammony, followed by any of the purgative mineral waters, are the purgatives on which the most reliance can be placed. Croton oil is sometimes a valuable remedy, from the facility of its administration and certainty of its effects. Mercury may be given freely as a purgative.

Use of an Emetic.—We have sometimes found tartar emetic of great service when there was no irritability of stomach to prevent its being tolerated; the power of tartar emetic in controlling the action of the heart and subsiding the inflammatory diathesis is now fully established; a solution in the proportion of one grain to the ounce and a tablespoonful given every hour or two, suspending it should vomiting occur, has often been attended with great benefit. The remedy is in general well tolerated, owing to the torpor of the stomach; violent vomiting should, however, be prevented, as it would obviously be extremely injurious.

Treatment of Second Stages.—In the second stage of acute cerebritis, that of collapse and coma, general blood letting is to be used most sparingly; decided advantage, however, has resulted from a moderate bleeding even at a late period. In this stage topical bleeding is more generally indicated. There are periods of exacerbation in the symptoms which should be watched and overcome by these means, which may be persevered in as long as there is any hardness and resistance in the pulse. We have seen a patient instantly recover from a state of profound coma by the abstraction of a very small quantity of blood with the cupping glass. In this stage we may have recourse to counter-irritation with advantage; blisters may be applied between the shoulders, to the occiput or to the neck or legs. There is an objection to their being applied to the whole head, that it prevents the subsequent application of cold. We have, however, in desperate cases, seen a decided amendment follow the application of a large cap blister. Particular attention should be paid to the abdominal region, and especially that of the bladder, which ought to be examined morning and evening in order to detect retention of urine, and we must take care not to be led into error by an incontinence of urine from the over-distension of the bladder; this must be obviated by drawing off the urine with the catheter twice a day.

Treatment of Chronic Forms.—In the more chronic forms of cerebritis, unattended with fever or much general excitement, the same activity of treatment is of course not admissible. We must still, however, pursue the antiphlogistic plan, modifying it according to the urgency of the symptoms. During the period of irritation, with cephalalgia, vertigo, or rigid spasm of the extremities, moderate bleeding, general and topical, purgatives and counter-irritation are the only remedies from which any advantage is to be expected; they must be repeated at longer or shorter intervals, according as the strength of the patient and the continuance of the symptoms may seem to indicate. A great deal is to be accomplished in all chronic inflammations by persevering in a moderate course of antiphlogistic treatment.

We must watch carefully any signs of amendment, remembering that there is a great tendency to collapse, and that the natural course of the complaint is characterized by irregular remissions and exacerbations.

When to Cease Active Treatment.—When the period of irritation is over, and is followed by a remission of all signs of excitement, by a complete paralysis of the muscles, and by other evident signs belonging to the period of softening and suppuration, the strength of the patient must no longer be reduced by active treatment. In all inflammatory diseases, when the stage of excitement and disorganization is over, a process of reparation commences, which requires for its completion a certain degree of power in the constitution. If at this period we persevere in lowering the general strength, we deprive the constitution of its natural resources and interfere with its healing operations.

When the Excitement Turns.—It becomes, therefore, an object of considerable importance to watch the moment when the tide of excitement is on the turn, and when the powers of the constitution are verging to a state of collapse, in order that we may abstain from an injurious interference, husband the patient's strength and even support it if required. This precaution is particularly necessary in old people and young children.

Convalescence.—After convalescence has been established the patient will still require to be closely watched for some time before his recovery can be considered fully confirmed; he must be kept perfectly quiet, free from every species of excitement and the regimen duly regulated. When the brain has once suffered from inflammation it is slow in recovering its tone, and the most trifling cause, such as a slight mental exertion or emotion, a full meal, and so forth, has been in many cases sufficient to occasion a relapse.

Suppressed Menstruation.—When cerebritis has occurred after suppressed evacuations or the metastasis of other diseases, we should endeavor to procure their return. If menstruation is suppressed, leeches should be applied to the pubis or inguinal regions, and the frequent use of hot pediluvia recommended. If cutaneous eruptions or rheumatic gouty pains in the joints previously existed, blisters or rubefacients are to be applied to the parts originally affected.

Summary of Symptoms of Brain Congestion.—The following summary gives a connected view of the various morbid conditions of the brain, which are the effects of congestion and inflammation, together with their symptoms:

Cerebral Congestion.—Cerebral congestion, over-distension of vessels; vertigo, tinnitus aurium, confusion of sight, cephalalgia, if the pressure in the vessels be carried to a sufficient extent to intercept the circulation; simple apoplexy, seldom fatal, recovery rapid.

Permanent Cerebral Congestion.—If the cerebral congestion be permanent, or returns frequently; drowsiness, oppressed intellect; the vessels become weakened and on a sudden increase of congestion are ruptured; extravasation of blood, sanguineous apoplexy; destruction of cerebral substance and compression; loss of consciousness, permanent or temporary; sudden and complete paralysis without spasmodic affection of the muscles.

General Congestion.—General congestion, followed by inflammation of a considerable portion of the brain; deep injection; partial sanguineous infiltration; dotted and ecchymosed striated appearance of the cerebral substance; general cerebritis (combined usually with arachnitis). Period of high excitement of all the cerebral functions, with general convulsions, followed by a period of collapse and coma.

Partial Congestion.—Partial congestion and inflammation of the brain; 1st period, the same deep injection and sanguineous infiltration, more circumscribed; partial cerebritis. Partial symptoms of irritation in the organs of motion and sense; weakness, pain, numbness, spasmodic paralysis, confined to one side or a few regions of the body. 2d period, infiltration of pus in the cerebral substance; softening; abscess; complete paralysis; relaxation and flaccidity of the muscles; loss of feeling; abolition of some of the external senses or intellectual faculties; death, either gradual or sudden, by the extension of the inflammation or by pressure.

Cerebral Inflammation.—After sanguineous apoplexy and sudden and complete paralysis, inflammation of the cerebral substance surrounding the coagulum; consecutive cerebritis, the paralyzed limbs affected with pains, convulsive motion, spasmodic rigidity.

Slow Congestion.—Slow and gradual congestion with very slight irritation; long, continued state of low inflammation, ending sometimes in softening, sometimes in induration, or else in an infiltration of serous fluids and white softening. Various forms of chronic cerebritis, sense and motion very gradually weakened and impaired without pains or spasmodic rigidity in the muscles.

DROPSY OF BRAIN.

(*Hydrocephalus.*)

Causes.—Water in the head; dropsy of the brain. This is almost always an affection of early life. Sometimes it is congenital. It is mostly a passive dropsical effusion; certain cases show signs of a chronic or subacute inflammatory condition of the arachnoid membrane of the brain.

Symptoms.—Languor, strabismus, convulsions, loss of appetite and increase in the size of the head. This last may be enormous.

Treatment.—Moderate purging every few days, or once a week, sustaining the strength by nourishing food, and, if it be borne, cod-liver oil; diuretics; shaving the head and rubbing it nightly with mercurial ointment; occasionally blistering the back of the neck, in a child. Pneumatic aspiration may perhaps prove useful in hydrocephalus. To remove the fluid gradually and safely mild stimulating baths have a very beneficial influence.

INFLAMMATION OF THE SPINAL MARROW, MYELITIS, SPINAL MENINGITIS.

Symptoms.—The symptoms of this uncommon affection are: constant and severe pain in the back increased by motion; spasmodic contractions or rigidity of the muscles followed by paralysis, fever, constipation of the bowels and retention of urine. In myelitis proper, as distinguished from spinal arachnitis, there is no pain or muscular rigidity but only paralysis of motion and sensation.

Treatment.—Cupping or leeching along the spine, followed by a blister and active purgation with saline cathartics, constitute the essential parts of the treatment of simple inflammation of the spinal cord or of its membranes.

APOPLEXY.

Causes.—These have been divided into external or obvious and internal or such as can only be discovered after death. The external causes or those acting mechanically by evoking pressure on the brain; such are fracture of the skull with depression of a portion of bone, or blood extravasated immediately beneath the fractured bone without depression. The reality of this cause is shown by the effect of direct pressure made upon the surface of the brain by the point of the finger in cases where a portion of the skull has been removed by the trepan, or on the fontanelle or opening between the cranial bones in the head of infants. Causes tending to increase the arterial action of the brain, either by direct application to the head itself, or indirectly through the medium of other organs. Causes which operate by impeding the return of blood from the brain, as stooping; the application of a tight ligature round the neck so as to compress the internal jugular veins; tumors of any kind so situated in the neck or chest as to interrupt the return of blood from the brain to the heart; diseases of the heart or lungs impeding the transmission of the blood through the pulmonary vessels; or a voluntary suspension of breathing after a full inspiration; or in blowing wind instruments, or in making great muscular efforts of any kind. The internal causes are those that are only discoverable after death, viz., extravasation of blood in the substance of the brain or in the ventricles, or serous accumulations in any of the cavities or between its membranes.

Symptoms.—We have two forms of genuine apoplectic seizure: congestive and hemorrhagic. In the first the premonitory symptoms are, flushed appearance of the face and eyes, heat of head, throbbing of the carotids, distension of the temporal arteries and jugular veins; constipation, languor, dullness, drowsiness, dimness of sight, vertigo, headache. The attack is marked by sudden stupor; with slow and sometimes snoring respiration, full and slow pulse, dusky or turgid appearance of the face. The total loss of perception may be brief, its partial absence or deficiency continuing for some time. Slight convulsive movements are not uncommon. Paralysis of the muscles occurs only for a short time after the attack, if recovered from.

Hemorrhagic Apoplexy.—In hemorrhagic apoplexy generally no clear premonition is given, the attack being very sudden; a stroke, literally unconsciousness is complete for some seconds, minutes or hours. After this, general or local paralysis, most often hemiplegia (paralysis of one side of the body) is left; the mental powers also, in many cases, being impaired at least temporarily, during the coma; the breathing is commonly stertorous and the pulse slow and somewhat full, the head hot and the face more or less dark or flushed. But the fullness of the blood-vessels and heat of the head are much less, as a rule, than in congestive apoplexy.

The younger the patient and the more vigorous his antecedent health the more probable is the existence of the congestive form; and, also, the better the prospect of recovery from hemorrhage within the cranium, if only the effects of pressure be exerted at the time.

Treatment 1.—If, in a person under fifty, not before of broken constitution, we find the head hot, face turgid and flushed, the arteries and veins of the neck and temples full, the pulse also strong, and the heart's impulse so (or the heart's action vigorous though the pulse at the wrist be oppressed) blood may be taken, carefully, from the arm or by cups or leeches applied to the back of the neck.

2. Older and more doubtful cases may be treated tentatively with cups alone, aided by mustard plasters to the legs, back and epigastrium in turn; with laxative injections into the rectum during the attack and saline purgatives afterward. The head should be kept raised and cooled with wet cloths until its temperature becomes normal. If the hair be thick, it should be cut very short or shaved off entirely and an ice-cap placed thereon over the whole surface. When, however, there is reason, as usually is the case in really old or broken-down patients, to believe the structural degeneration, arterial or that of ramollissement, is the source of the attack, loss of blood will be out of place.

LOSS OF SPEECH.

(*Aphasia.*)

Symptoms.—Loss of speech may occur as one of the symptoms of disease of the brain, either functional and transient, or organic and irremovable. Such a loss of language is termed aphasia, not articulation, as in aphonia, but expression is, in this affection, wanting. The power to unite words from memory, to convey meaning, is lost; but, in some cases, at least, they may be copied correctly.

Causes.—Hemiplegia of the right side has in a number of examples coincided with aphasia, and, several times, also, autopsy has shown softening or other lesion of the left anterior portion of the cerebrum. Valvular lesion of the heart sometimes accompanies this disease.

Treatment.—Cases of aphasia are very rare. There is no special measure of treatment except that of general principles, and treat untoward ones as they arise.

SUN STROKE.

Symptoms.—This is a disease occurring in persons exposed to excessive heat and characterized by vertigo, sometimes with violent pain in the head, gradual increase of listlessness and torpidity and a desire to lie down. The feverish symptoms may culminate in more or less sudden and complete insensibility.

Treatment.—The most obvious demand in regard to treatment is to abstract the excessive heat from the body as rapidly as possible, and this can be most speedily accomplished by cold sponging, rubbing the head, neck and chest with ice or by the cold pack. Light should be excluded from the patient as far as possible, and if the pulse is feeble stimulants should be given by the mouth or by injection. If prompt improvement does not occur the hair should be cut short and a blister applied to the nape of the neck.

THE NERVES.

FIGURE No. 1.

1. Plexus or bunch of nerves in the carotid region.
2. Sixth external motor nerve.
3. First branch of the 5th ophthalmic nerve.
4. A branch on the nose partition, which goes to the incisive *foramen.*
5. Concurrent branch of the *Vidian* nerve, dividing itself into carotid and petrosas branches.
6. Back branches of the palate.
7. Lingual nerve joined by the tympanum cord.
8. Hard part of the 7th pair or facial nerve.
9. Upper cervical ganglions.
10. Middle cervical ganglions.
11. Lower cervical ganglions.
12. Roots of the great splenic nerve.
13. Lesser splenic nerve.
14. Renal plexus.
15. Solar plexus.
16. Mesenteric plexus.
17. Lumbar ganglions.
18. Sacrum ganglions.
19. Vesical plexus.
20. Rectum plexus.
21. Lumbar plexus.
22. The rectum.
23. The bladder.
24. The pubis.
25. Crest of the ileum.
26. The kidney.
27. The aorta.
28. The diaphragm.
29. The heart.
30. The larynx.
31. The submaxillar gland.
32. The incisive teeth.
33. The nasal partition.
34. Globe of the eye.

35, 36. Cavity of the cranium.

FIGURE No. 2.

1. Section of the bone of the forehead.
2. Section of the occipital bone.
3. Muscles in the back of the neck.
4. Integuments on the skin.
5. Frontal cavity.
6. Middle spongy bone.
7. Lower spongy bone.
8. Middle passage of the nose.
9. Lower passage of the nose.
10. Thickness of the roof of the mouth and depth of the nose.
11. Opening of the eustachian tube. The catheter is at the nose and is going through the tube.
12. Cartilage of the nasal division.
13. *Genio-gloso* muscle.
14. Veil of the palate.

FIGURE No. 4.

1, 1. The cubital nerve.

2, 2. The ramus profundis dorsalis (deep-seated nerve of back of arm).

3. Extreme of the cutaneous nerve of the arm.
4. Branch of the radial nerve.

5, 5. Back view of the digital nerves, or of the fingers.

6. Back branch of the cubital nerve.

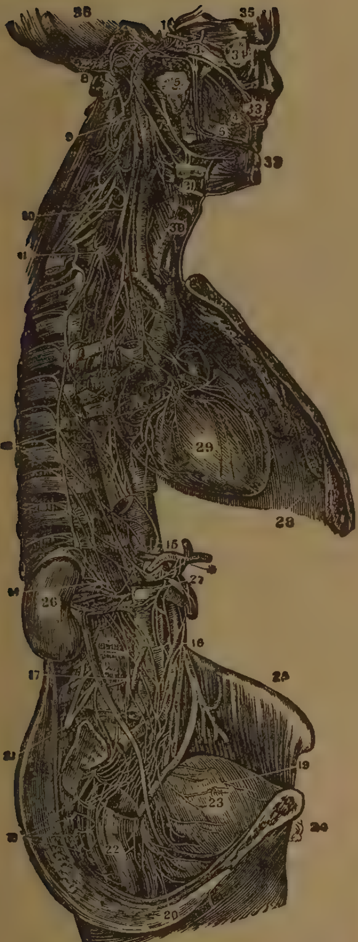


FIG. 1.—The great sympathetic nerve.

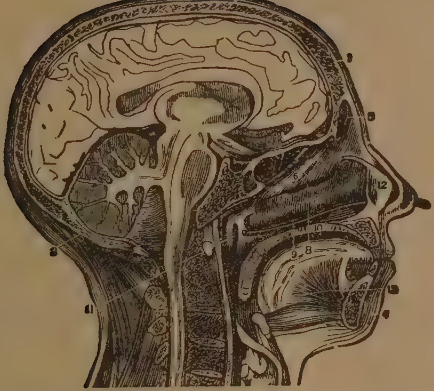


FIG. 2.—Vertical middle section of head and neck, showing the opening through the eustachian tube, and its relations with the pharynx.

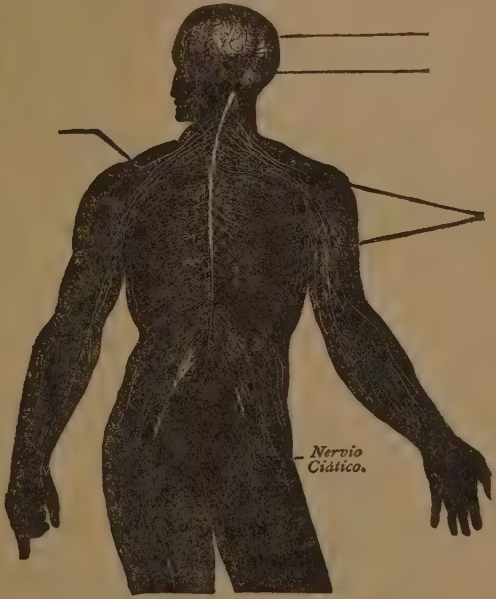


FIG. 3.—View of the nervous system in man, showing the nervous centres (the brain and the spinal near row) whence start the other nerves which provide the whole body.

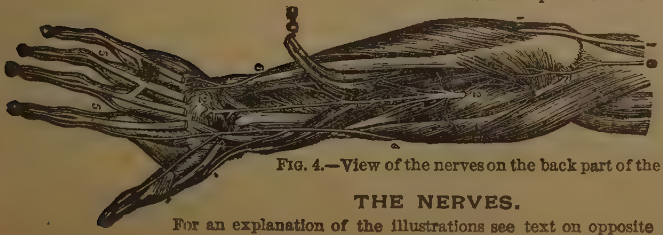


FIG. 4.—View of the nerves on the back part of the forearm and hand.

THE NERVES.

For an explanation of the illustrations see text on opposite page.

Heat Exhaustion.—In heat exhaustion the patient is generally found with a cool skin, a feeble pulse and pallid face, without disturbance of the intellect. In such a condition stimulants, dry heat of hot-water bags or bottles, mustard plasters to the stomach and perfect rest and quiet are indicated.

HYPERTROPHY AND ATROPHY OF THE BRAIN.

Meaning.—Hypertrophy means an actual enlargement or overgrowth of the brain structure generally, while atrophy signifies a general wasting of the substance of the brain.

Causes.—The brain is sometimes the seat of morbid growths, including cancers, fibroid and bony tumors, tubercular deposit in large masses, and casts containing parasites. All these affections are, fortunately, very seldom met with.

Treatment.—The treatment in such cases is, of course, to cut out the tumor and the affected portion of the nerve with as little delay as possible, whenever it can be accomplished.

PARALYSIS OR PALSY.

Causes.—Palsy is one of the most common and most distressing misfortunes from which mankind is obliged to suffer. Yet its various forms are rather symptoms of deep-seated disease than disease themselves. Thus palsy of a limb is very frequently a symptom of structural disease of the brain or spinal cord, but it occasionally occurs from a diseased nerve trunk itself. It may affect a whole limb or only part of one, and is sometimes limited to a group of muscles in a particular region.

Symptoms.—The following conditions give rise to paralysis of motion:

1. Disease or injury to a nerve in some part of its course, destroying its power of transmitting the force, which is expressed by a contraction of the muscle to which the nerve is distributed.

2. A disease of some portion of those central parts of the nervous system, whence the nerve takes it origin, or with which it may be connected directly or indirectly.

Varieties of Palsy.—There are many varieties of palsy, among the most important of which are the following:

According to its nature it may be motor (acinesia), and sensory paralysis (anesthesia).

Facial Palsy.—This is an affection of the portio dura of the seventh pair of cephalic nerves, the motor nerve of the face. It occurs at any age, usually from rheumatoid inflammation of the sheath of the nerve at its escape through the cranium, through the stylo-mastoid foramen.

Symptoms.—On one side of the face is without change of expression, and the eye on that side is not closed (in severe cases) from the paralysis effecting the orbicularis palpebra muscle. The tongue is not affected in the movements. The facial motor nerve is not often involved in the much more serious cases of cerebral palsy.

Diagnosis.—Absence of disturbance or of incompleteness of control over the tongue, while the power over the eyelid is partly or wholly lost with the absence of severe cerebral symptoms, will, especially in a young person, make the diagnosis easy as well as important.

Treatment.—The treatment of this form of local palsy may be by repeated small blisters behind the ear, followed, when convalescence has begun, by some warm covering (cotton wadding, flannel or silk) to protect the part from cold.

Writer's Cramp.—Pressure upon a nerve may cause its paralysis, generally temporary. A man has been known to have his hand rendered powerless for three weeks by sleeping all night with his arm bent under his head. Friction, the endermic application of strychnia and galvanism may be used in such a case. Writer's cramp or scrivener's palsy, is the result of exhaustion of certain muscles from over-use. Its cure is rest.

Hemiplegia.—This means half palsy and is a paralysis in which one lateral half or side of the body is stricken with powerlessness so accurately that it is customary to define the condition by the terms right and left.

Causes.—Brain lesion is most often the cause of this affection; either an apoplectic clot, a tumor or softening.

Symptoms.—In severe cases the arm and leg may be equally motionless, but if there is any difference between them the leg is generally the limb less affected, the last to be attacked, and the first to recover some of its powers. Suddenly, almost always, but not always with loss of consciousness, the patient loses the power of motion and more or less sensation on one side. In complete cases the parts involved are the arm and leg, the muscles of mastication and half of the tongue.

Treatment 1.—Essentially the same principles are applicable to this as have been mentioned in connection with apoplexy. The younger the patient the more vigorous his or her previous health, and the fuller the circulation the more appropriate may be the general or local abstraction of blood to diminish pressure upon the brain. Where softening is apprehended bleeding should be exceptional and cautious. Rest, regulation of the bowels, and counter-irritation of dry cups to the upper part of the spine, and afterward a blister, with friction, as with brandy and red pepper, or whiskey and hot water, or salt and spirits, to the affected limbs.

2. In the hysterical form, if it lasts long, electricity may be applied locally with safety and advantage. In any curable case passive exercise of the weak limbs will be very useful.

Paraplegia.—Paraplegia is that form of palsy in which one-half of the body below the chest and including the lower limbs is stricken with the disease.

Causes.—Spinal disease or injury is its source, with or without cerebral implication or complication. It may come suddenly or gradually, generally its beginning, at least, is sudden.

Symptoms.—When the spine is affected, as well as in the reflex form, numbness in the feet and pain in the back are apt to be early signs. The power of motion is lessened or lost in the lower limbs. The muscles may be either relaxed or contracted. The lesion of the spinal marrow, if progressive, is productive of loss of power over the bladder and bowels. Bed-sores with deep ulceration and sloughing may occur in protracted cases.

Treatment.—When myelitis is believed to exist, at an early stage, local depletion to a moderate extent may be advised. In may cases counter-irritation by repeated sinapisms, or stimulating liniments will be proper. While inflammation or active irritation of the spinal cord is made apparent by the symptoms (pain, cramps, muscular twitching or rigidity), strychnia is not suitable. After these have subsided it may be given, not more at first than the thirtieth of a grain twice daily. If it produce jerking movements of the hands or feet, or nervous restlessness, or any marked uneasiness it should be suspended. Electricity may be used with similar caution in a secondary stage of paraplegia.

Hysterical Paralysis.—In females this is among the many forms of functional disorder which that strange but not yet clearly defined disorder, hysteria, may produce.

Diagnosis.—The affected limb, in walking, is dragged after the other, as if a dead weight; while in cerebral hemiplegia the palsied leg and foot are brought round in a curve, the body being bent toward the sound side at the time.

Treatment.—Tonics, good nourishment and change of air are most required in all hysterical cases. For the paralysis itself electricity is useful. Mild shocks for a few minutes twice a day may be given with advantage.

Reflex Paralysis.—Causes.—Worms, dysentery, diarrhœa, uterine irritation, teething and external injuries are all thought to induce reflex paralysis in certain instances. Diphtheritic and scarlatinal palsies have been placed in the same category. The simplest and clearest cases are those of wounds.

Treatment.—In true reflex paralysis the removal of the irritant cause produces instant relief. When the nature of the case does not admit of such prompt relief, if the diagnosis be clear, the same indication remains, to address our remedial measures to the seat or source of peripheral irritation. Palliate, if we cannot cure the trouble there, and we will obtain palliation, if not relief, of the reflex disability. Electricity has proved signally useful in the subsequent treatment.

Diphtheritic Paralysis.—After the termination of an attack of diphtheria, commonly within three weeks, the muscles used in swallowing and speaking, less often those of the upper and lower limbs and the sense of sight may be partially paralyzed. Loss of sensibility usually accompanies the loss of motor power. This condition of things may last for weeks or even months, but is generally recovered from.

Causes.—The immediate cause of the paralysis of the peripheral lesion of the nervous terminations is the toxemic influence upon those centres of the morbid poison of diphtheria.

Treatment.—Passive exercise, stimulating friction and electricity, change of air and sea-bathing are suitable measures for this affection.

Syphilitic Paralysis.—The most unequivocal instances of this nature are accounted for by periostitis within the cranium, involving the dura mater, or by nodular exostosis pressing upon the brain. The most remarkable fact connected with such cases is the prompt curative effect upon it of iodide of potassium.

Lead Palsy.—Considerable time of exposure to the influence of lead is generally necessary to cause this. So commonly does it first affect the extensor muscles of the forearm that the cognomen of "wrist drop" is often applied to it. When it lasts for some weeks the muscles waste away.

Symptoms.—A blue line is observed to form along the edge of the gums. Pain precedes the palsy and attends recovery of power. Mostly, though after a long time, lead palsy is recovered from.

Treatment.—Iodide of potassium appears to act as an eliminant of the lead accumulated in the system. Ergot is also useful. Faradaic electricity has been found decidedly beneficial used in moderate strength for a few minutes two or three times a day.

Mercurial Palsy.—This is occasionally met with in those who work in metal. Mostly tremor is a predominant symptom. Early withdrawal from the influence of the cause and the continued use of the iodide of potassium are the principal measures of treatment.

Paralysis Agitans, called also shaking palsy, is described as a more or less constant involuntary and uncontrollable shaking of the hands, arms, head or, progressively, of the whole body. Slight or moderate degrees of such tremor are common enough from general nervous debility. Extreme cases evince the wreck of the cerebro-spinal system and are, therefore, incurable. In other cases the treatment is upon general principles.

Progressive Muscular Atrophy.—This is still another uncommon and incurable form of paralysis due to a gradual decay and wasting of the muscles, but commencing sometimes with an apparent enlargement or hypertrophy of these organs.

Locomotor Ataxia.—This results from a disease called sclerosis, or hardening of certain motor-centres in the brain and spinal cord.

Symptoms.—Rheumatoid pains precede loss of power, occasional strabismus (cross-eye) and incontinence of urine may occur. Then there is an awkward, unsteady gait; the sensibility of the feet becomes blunted, and walking is insecure. If the patient shuts his eyes he falls down, and even with them open he reels as if drunk. The duration of this progressive disease varies from six months to ten or twenty years.

Treatment.—Hygienic management, general tonics, electricity and very careful use of strychnia.

Infantile Paralysis.—This is a variety developed in very young children and occasionally present from time of birth. As a rule this palsy arises from disease of the spinal cord and its membranes.

Symptoms.—It comes on with acute symptoms of fever and convulsions, ending in paralysis of one or more limbs. In some cases the child gradually recovers from the effects of the malady, but in many the impairment is permanent and the limb, ceasing to develop in proportion to the rest of the body, appears in the adult as if shrunken and withered, constituting a lamentable and hopeless deformity.

Treatment.—Much can be done towards preventing complete loss of power by persevering and systematic movements, application of galvanism and exercise as suggested in the article on hemiplegia.

Scrivener's Palsy.—Called also writer's cramp. It is the result of long continued and unnatural excitement of the nerves controlling the fingers and hand in writing.

Symptoms.—The earliest indication is a painful sense of fatigue and weakness which come on shortly after commencing to write. Sooner or later this begins to be accompanied by involuntary spasms of the muscles employed in holding the pen and the handwriting grows unsteady, scrawly and almost illegible. At first the spasms and irregular movements can be more or less controlled by voluntary effort but they gradually become worse and worse, until at last the use of the pen is an impossibility.

Treatment.—Rest from writing, tonics and electricity accomplish a cure in some instances, but the prospect of recovery is small, and it is, therefore, very important to avoid the disease by moderation in writing, or by the use of the ingenious typewriter.

Wasting Palsy.—A few of the muscles of one limb, or the voluntary muscles of the whole body may lose their power and then waste away to almost nothing. Insidious in its approach the affection may last from six months to several years. It may end in recovery. The shoulder and ball of the thumb are frequent points of commencement for the palsy and atrophy.

LOCK-JAW.

(*Tetanus.*)

Description.—When a patient is the subject of an uncontrollable spasmodic contraction of the muscles of the lower jaw, he is said to have "trismus" or lock-jaw; and when the same condition attacks other or all the voluntary muscles of the body he is said to have "tetanus."

Causes 1.—Tetanus includes trismus and generally begins with it, though trismus may be a local affection. It is found in children as a result of dentition, and in adults as a consequence of diseases involving the teeth, gums or jaws. It is a spasmodic affection produced by reflected irritation set up by a local disease, is rarely associated with any constitutional disturbance and is, for the most part, cured on removal of the cause.

2. Tetanus is likewise generally associated with some local source of irritation, some wound or injury, it is then called "traumatic;" when an external or visible cause can be made out, it is denominated "idiopathic;" when rapid in its course it is called acute; when slow, chronic. The acute form is usually the result of an accident and generally fatal. The chronic is for the most part idiopathic and more curable.

Symptoms.—There are no general or local premonitory symptoms by which the onset of this affection can be recognized, and the earliest indications of its approach are generally a difficulty in opening the mouth, with stiffness in the muscles of the lower jaw; yet these symptoms may be so slight as to pass unheeded, or to be misinterpreted, when, however, some rigidity of the muscles of the neck, throat or abdomen can be made out and the first indications of the "tetanic grin" recognized.

3. As the disease progresses the muscular system of the body generally will be more or less affected, and, in different cases, different groups of muscles will be involved. Those of the back are most frequently attacked and their contraction may be so powerful as to cause an arching backward of the frame. The muscles of respiration are, as a rule, affected only in acute cases, and the chief danger to life consists in the severity of the spasms which attack them. When severe the first spasm may be fatal and may occur at an early or at a remote period of the affection. When the jaw is unlocked by a spasm of the depressor muscles, the tongue is sometimes suddenly shot out from between the teeth and often wounded.

4. As the disease advances the jaws become completely fixed and deglution is then impossible. The spasms of the muscles of the frame become more intense and frequent and the powers of the patient rapidly decline. The pulse which was rapid becomes more feeble, while the expression of the countenance betokens agony of the body and despair of the mind. The slightest manipulation or movement of the patient sets up a fresh spasm, and any emotion may do the same. The skin becomes bathed with a cold sweat, and, if death is not caused by suffocation, exhaustion soon puts an end to suffering.

Treatment.—Among the specific remedies which have been greatly trusted the Colabar bean stands foremost and may be given in full doses, such as half a grain of the extract in two or three hours. Camphor is also recommended in doses of from five to ten grains. The bromide of ammonium or potassium has been administered with advantage. It was hoped that a valuable drug for this disease had been found in chloroform, but experience has not justified the expectation. The hydrate of chloral has now taken its place and been of some service. Indian hemp in doses of a grain every hour, aconite and belladonna in quantities of one-fourth of a grain have also been recommended. Ice applied in bags along the spine has apparently been of great value. The administration of remedies by subcutaneous injection, in these cases, promises to be a valuable adjunct to practice, enabling us rapidly to introduce into the system drugs which act antagonistically to tetanic spasm.

HYDROPHOBIA.

Meaning the "dread of water," which is more correctly termed "rabies" is a disease contracted from a rabid animal, generally from its bite through the saliva or mucus.

Stages of the Disease.—In the dog there are three well-marked stages of the complaint. The first is the melancholic, characterized by melancholy, depression, sullenness and fidgetiness; the second, the furious, by excitement or rabid fury, and the last, the paralytic, by general muscular debility and actual paralysis.

Symptoms 1.—In man the disease may show itself at any period from six weeks to a year after the inoculation. A month or more after the bite of a mad dog, or other rabid animal, the wound having healed, irritation is felt in it, nervous restlessness also exists which increases (in most cases) to violent, angry delirium. Then difficulty of swallowing occurs from a spasm of the muscles of inspiration (gasping) taking place at the moment of deglutition, making the patient choke.

2. The same spasmodic gasping is brought on by any sudden impression, as of sound, a flash of light or even a current of air passing over the face. Insomnia exists; the patient grows prostrate and must die for want of food and drink, even if the affection of the cerebro-spinal axis were not itself fatal.

3. There is intense thirst, but the characteristic dread of water, not as a fluid, however, but as connected with the difficulty of drinking. The sight of water is frequently sufficient to bring on shuddering, yet it is when the patient carries water to his lips that he is seized with the typical terrors.

4. A rabid man is always rational and tries to drink but the attempt excites terror and the expression of his inability. His eyes become fixed, features contracted and his countenance expressive of the deepest anxiety, his limbs shake, and the whole body shivers. The paroxysm lasts a few seconds, then subsides, but only to be renewed on the slightest breath of air touching the body. During the calm sudden terror of an unknown kind haunts the mind and imaginary calling of friends often exists.

Symptoms of Last Stage.—In the third and last stage the longing for drink becomes intense, with an increasing inability to take it; the voice becomes hoarse and the mouth full of frothy fluid. The patient tries to get rid of this by spitting, and then becomes frightened at its results. Convulsive seizures increase in frequency and intensity, the spasm of the respiratory muscles threatening life; at last a fatal spasm takes place and death by asphyxia ensues.

Treatment.—There is not satisfactory evidence that a case of genuine rabies canina or hydrophobia has ever been cured. If we cannot cure, what can or should we do? We may certainly promote easy death by allaying the wretched sufferings of the patient by nitrous oxide, ether, or chloroform. Hypodermic injection of atropia or morphia might, perhaps, more effectually quiet the suffering and even afford more possibility of cure than inhalation of anesthetics. In all cases of bites from dogs or animals, however, in which the faintest suspicion of rabies exists, free cauterization with lunar caustic should be performed. Mental stimulants, in the way of inspiring hope and removing fear, must be duly administered and such general treatment as may be needed. No drug has yet been discovered that has the least influence on the disease, either in preventing or curing it.

What is known as the "Pasteur cure for hydrophobia" is in great favor among some medical men. It is rather a preventive agent or treatment and no doubt possesses great value.

FITS OR INFANTILE CONVULSIONS.

Causes.—The exciting causes are numerous, constipation of the bowels, indigestion, worms, irritation of the gums in teething and excitement of the brain, as by fright, are about the most frequent. Many acute and chronic diseases of infancy (scarlet fever, meningitis, whooping-cough, and so forth) have convulsions among their occasional symptoms or complications.

Symptoms.—Premonition of a fit is often observed in the child's fretfulness, or restlessness, or gritting of the teeth in sleep. When a fit comes on the muscles of the face twitch, the body becomes rigid at first, then in a state of twitching motion, the head and neck are drawn backward, the limbs violently flexed and extended; sometimes these movements are confined to certain muscles, or are limited to one side.

Treatment 1.—The treatment of a child during the convulsion is, of course, to be directed first toward relaxing the spasm, and immediately after that is accomplished to removing the cause of the trouble, which, in two cases out of three, will prove to be irritation of the gums or bowels. To shorten the paroxysm the child should at once be placed in a warm bath and a cloth wrung out of cold water applied to its head.

2. If the gums are swollen, or have been tender and irritated at the

time of teething, lance them freely, dividing the tense gum down to the coming tooth. If the bowels have not been moved give at once an enema of castor oil, soap and molasses, or some other laxative material, with warm water. If there is reason to suppose that the intestinal worms, which most children harbor, are causing disturbance, active vermifuges such as a grain of santonine before dinner and supper for a child two years old, followed by two grains of calomel at bed-time, ought to be employed.

3. Cupping the back of the neck, in some cases where time is allowed by a protracted fit, may be resorted to, especially dry cups. Full doses of bromide of potassium, asafetida and valerian are often very useful in diminishing the excitability of the nervous system, which is especially great during the age of childhood.

· Prescription:

℞.—Bromide of ammonia........................	40 grains
Bromide of potash.........................	½ drachm
Fluid extract of gelsemium................	20 minims
Extract of valerian fluid...................	20 "

Half a teaspoonful for a child 2 years old, every three or four hours.

FALLING SICKNESS OR EPILEPSY.

Periodical convulsions with unconsciousness during the attack.

Causes.—Hereditary transmission of this disease is common. Intemperance, venereal excess and self-abuse, blows on the head and fright are among the most frequent exciting causes.

Symptoms.—Premonition occurs in a minority of cases before an attack; headache, dizziness, terror, spectral illusions, a creeping or blowing sensation, like that of a current of air or stream of water, beginning in a hand or foot and extending toward the trunk. Then, often with a scream, the patient falls down and is violently convulsed. Foaming at the mouth, grinding of the teeth and biting of the tongue are common; the face is flushed, the eyeballs roll, the pupils are unaffected by light, sometimes vomiting, or involuntary urination or defecation takes place; the respiration may be very laborious. The fit lasts on an average from five to ten minutes. The interval between the attacks may be from several months down to a few days. In old cases there may be two or three paroxysms daily. They vary much, even in the same individual. The condition after the attack is also various, generally drowsiness or deep sleep follows it, or headache, debility or delirium, sometimes maniacal frenzy.

Treatment 1.—During the paroxysm, when habitual, little can be done. Place the patient so that he cannot strike his head or limbs against any thing hard, loosen the clothing about the neck to form free respiration and circulation and insure fresh air about the patient, protect the tongue from being bitten, if possible, by placing a cork or piece of India rubber between the teeth. Care must be taken that such an object does not pass into the throat and choke the patient, which can be prevented by trying a strong string to it.

2. To break up the recurrence of the fits is the problem for which a vast number of remedies have been tried in vain. Bromide of potash, valerianate of zinc, belladonna, arsenic and digitalis have all been employed. Strangely enough this disease is very apt to improve temporarily under any new treatment, no matter how absurd, which takes a strong hold on the patient's imagination.

3. Self-management is very important to the epileptic. Temperance with nutritious diet is necessary; regularity of the evacuation of the bowels is imperative; abundant exercise in the open air, short of exhaustion, does good; systematic gymnastics have even cured some cases.

PRESCRIPTION.

℞.—Bromide of potash	3	drachms
Bromide of soda	3	"
Bromide of ammonia	3	"
Iodide of potash	1½	"
Iodide of ammonia	1½	"
Carbonate of ammonia	1	drachm
Tincture of columbæ	1½	ounces
Water	6½	"

Take two teaspoonfuls before each meal and three teaspoonfuls at bed-time.

SPASMODIC CROUP OR SPASM OF THE GLOTTIS.

Causes.—This is the most important of several varieties of simple spasm in different parts of the body. Among which ordinary croup is a familiar example. It consists in a spasm of the muscles of the glottis or opening into the windpipe, by which a crowing or croupy cough is produced, with hard or stridulous breathing.

Symptoms.—This disease especially occurs in young children, where it is due to some reflex irritation, such as that of teething, reflected from the nerve centres which control the muscles of the glottis. It may generally be distinguished from the alarming malady, true croup, by its coming on suddenly without fever, marked heat of skin or quickened pulse.

Treatment.—To relax the spasm sprinkling of a little cold water in the face, or tickling the fauces with the finger or with a feather, so as to produce vomiting frequently answers the purpose. Should it fail the child should be immediately placed in a warm bath. After an attack the gums should be carefully examined and freely lanced if found swollen, every attention being paid to the general health. Much needless alarm would be spared to anxious parents and nurses if it were generally understood that there is no likelihood of this disease leading on to the fatal malady, true croup, which may always be excluded from consideration if the child is free from fever, coughs loudly and has no huskiness of the voice.

CHOREA OR ST. VITUS' DANCE.

Causes.—From six to sixteen, in both sexes, especially often, however, in girls, chorea occurs. Nervous debility is almost always present before the attack. Fright is a frequent cause, overfatigue or mental excitement, blows or falls may produce it. Rheumatic fever is sometimes followed by it.

Symptoms.—Incessant and irregular movements of the voluntary muscles over which the will has but partial control. Walking in severe cases is difficult or unsafe; the hands cannot be regulated enough to write or work; speech may be affected; the muscles of the face often twitch grotesquely. The pupil is, in some cases, unnaturally dilated; palpitation of the heart may occur, and also constipation and indigestion. The urine is of great density; the countenance assumes a blank and foolish expression, and the mind itself may in time grow seriously enfeebled.

Treatment.—Good diet, salt bathing and systematic gymnastic exercises will suffice for mild cases. Where marked anemia exists iron (citrate, phosphate or hypophosphate, tincture of chloride, syrup of iodide) is important. Obstinate cases may be treated with Fowler's solution of arsenic, in small doses, gradually increased. Cod-liver oil should be given if great debility exists. In chronic cases the tonics before mentioned with the addition of the hypophosphites should be resorted to, and change of climate is very likely to be of service.

HYSTERIA.

From its occurrence nearly always in females and from a supposition of its originating in some affection of the womb, this name has been given to a variable disorder, of which the main characteristic is morbid excitability of the whole nervous system.

Symptoms 1.—A "fit of hysterics" is a paroxysm whose nature may vary from mere uncontrollable laughter or crying to a severe epiliptiform convulsion. This last, however, differs from epilepsy in that being less complete loss of consciousness and in its curability.

2. Simulation of other diseases, indeed the assumption of severe functional disorders of different organs, is a common trait of hysteria. There may be hysterical amaurosis; hysterical insanity is not uncommon; nor is hysterical paralysis or coma rare. Retention of urine, cough, aphonia, and so forth, are often thus produced.

Catalepsy.—Catalepsy or trance is a condition allied to hysteria in some respects, in which the whole frame lies prostrate and helpless, or that a limb, if lifted up, falls back as if it were relaxed and dead while yet the consciousness of the person affected may be retained without the sensitiveness to physical pain. This curious state of existence is not well understood, and in our present ignorance of its nature the chief importance lies in its being distinguished from death early enough to prevent that most horrible of all human misfortunes, being buried alive.

Hypochondriasis.—This is a very obstinate affection, often hereditary, and occurring more frequently in men than in women. During the attack there is apparently great depression of mind without mental disease. The patient imagines he is afflicted with maladies of the most varied kinds; is tormented with ideas of impending miseries and dangers; thinks he suffers from swellings or contortions of the body, which may be purely creations of fancy. This disorder in the male corresponds very nearly to hysteria in the female, and like it can only be cured by attention to the general health. Tonics, exercise and cheerful occupation are the best remedies.

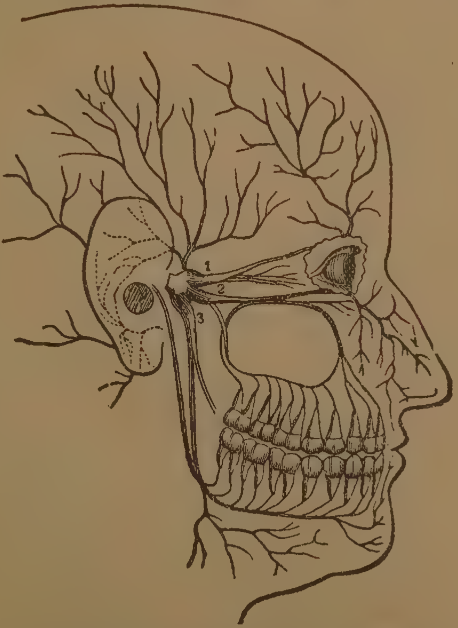
Treatment of Hysteria.—Much skill and care will often be required in the management of hysteria, as each one has peculiarities of its own. Generally a tonic regimen is demanded. Iron and cod-liver oil are most often the appropriate remedies. Bromide of potassium is sometimes quite useful. For a paroxysm of "hysterics" asafetida is universally safe and reliable in pills of three grains each. Sinapisms and pediluvia are also proper. Menstruation is often irregular in hysterical women; it should be regulated as far as possible. Exercise in the open air, as a rule, is very important for such persons. Mental and emotional excitement should be avoided; but tranquil, even engrossing, occupations will be beneficial. For hysterical paralysis electricity is promptly useful. Cold bathing, especially the shower-baths or sea-bathing, when followed by reaction, will do good.

NEURALGIA.

Meaning.—Pain, without inflammation or other disorder, except that of the nerve or nerve-centre involved; literally nerve pain. This may affect any of the sensitive nerves. It is also sometimes referred to parts which have, in health, no sensibility; as the heart, stomach, and so forth. Different names are given according to its site. Thus, tic douleureux is facial neuralgia; hemicrania, that affecting one side of the head; sciatica, that of the hip; gastrodynia, neuralgic pain in the stomach; pleurodynia, in the side. Angina pectoris is, chiefly, a neuralgic affection of the heart.

Symptoms.—The pain is generally acute shooting or darting, with tenderness of the part upon pressure. There is, however, no heat or swelling, or throbbing of the blood-vessels in pure neuralgia. Complicated cases occur in which inflammation and neuralgia exist together, and inflammation of the fibrous neurilemma may be the immediate cause of the neuralgic pain.

Causes.—Neuralgia is always dependent upon debility arising from one cause or another, as, for instance, anemia, mental anxiety, gout, rheumatism, syphilis and dyspepsia. In fact, a great German authority upon nervous diseases declares, with as much truth as poetry, that "neuralgia is the prayer of the nerves for iron in the blood."



Distribution of Nerves on the Side of the Face.

Next to the sciatic nerve no other is so often the seat of neuralgic pain as the trifacial, and this is, perhaps, partly owing to the fact that the superficial branches are spread out over a large surface upon the side of the face and more exposed to cold and changes of the weather than any other part of the body where the epidermis is equally delicate. Terminal branches of the trifacial come out through the bones of the head at points over the eye, beneath the eye and at the side of the chin—as shown in the marginal illustration. These, then are the tender points, where all the branches of this nerve are involved in the neuralgia, and it is from these points that the darting bony pains seem to radiate.

Hemicrania or Migraine.—This is a combination of neuralgic symptoms with ordinary headache occurring in paroxysms, and usually limited to one side of the head or brow. It is apt to commence in childhood and go on to advanced age, occurring in both sexes, but more often in women than in men. In women the attacks are especially apt to appear just before the menstrual period or during its course.

Causes.—The headache is probably due to excitement of the sensitive filaments of the trifacial nerve—distributed to the dura mater—and also to the sympathetic fibres accompanying the blood-vessels, which connect the nervous supply of the brain with that of the stomach so intimately.

Symptoms.—As generally manifested it increases rapidly soon after waking in the morning with chilliness, loss of appetite, sliminess of the mouth, sickness of the stomach, vomiting of a little greenish fluid, and at last the headache becomes so intense as to be almost unbearable.

Sciatica.—This is often associated with both rheumatism and gout, but is also frequently brought on by catching cold. Occasionally it is due to accumulations in the bowels, or to diseases of the bones through which the nerve makes its exit. The painful points are usually found back of the trochanter or most projecting point of the thigh bone, at certain spots in the thigh about the knee and ankle joints.

Intercostal Neuralgia.—This, like intercostal rheumatism, resembles the pain of pleurisy and of pneumonia, and has often given rise to unfounded anxiety as to the existence of these more dangerous diseases. It may be at once distinguished by careful examination of the lungs.

Neuralgias of the arm, neck, shoulder, and so forth, are all unhappily common and sometimes very intractable.

Pathology.—At least three sources of pain are possibly. 1st. Local disease affecting a nerve. 2d. A morbid state of a sensorial nerve centre. 3d. A morbid condition of the blood. Neuralgia always fixed or returning in the same spot, is likely, although not certain, to depend upon a fault in the nerve itself; as neuroma (tumor of a nerve). Radiating pain must at least involve part of a nerve centre. Flying pains, never long seated in one part of the body, are due to a defect or morbid poison (as that of gout or malaria) in the blood.

Treatment of Neuralgia 1.—This must, of course, depend upon the cause or nature of the case. Tic douleureux often depends upon decay of the teeth; if so, they must be attended to. Other purely local neuralgias require local treatment. Laudanum or paregoric, applied by saturating a cloth and laying it upon the part covered by oiled silk to prevent evaporation, is an efficient local anodyne. So is chloroform, similarly applied; it is very pungent, burning like mustard. Sinapisms will sometimes relieve promptly.

2. Mere warmth, as of flannel steeped in hot water, will do in some instances. Rubbing for a few moments with saturated tincture of aconite root until the skin tingles, or the application of ointment of veratria, twenty grains to the ounce of vaseline, may be used in severe cases. In the most obstinate ones a blister may be applied, dressed, after removal of the cuticle, with two grains of the acetate of morphia, diluted with ten grains of gum arabic. Carbolic acid is a powerful local anesthetic, though (unless diluted with oil or glycerine) very irritating to the skin; or, most prompt usually of all, solution of morphia may be hypodermically injected.

3. Of anodynes internally used, belladonna has, for neuralgia, the greatest reputation. It will not quell suffering so directly as opium or morphia, but it will more entirely do away with the neuralgic state. For this, however, iron, especially in combination with quinine or strychnia, is the most effective medicine. Cases of neuralgia which will not be benefited by iron are decidedly exceptional.

4. In some instances application of the galvanic current will remove the pain of neuralgia as if by magic, and when relief can thus be secured it is far preferable, as the distressing sickness, headache and constipation, which so often result from opium and other narcotics, may thus be avoided.

Auxiliary Treatment.—The hygienic treatment is almost equally important with the medicinal, and a thorough examination of the habits of life pursued by the patient will almost always lead to the discovery of some violation of sanitary law, which must be corrected before a hoped-for cure can be realized.

PRESCRIPTION 1.

℞.—Menthol	20 grains
Muriate of cocaine	10 "
Chloral	5 "
Vaseline	3 drachms

Apply the ointment to face where pain is seated.

PRESCRIPTION 2.

℞.—Citrate of caffeine	15 grains
Phenacetine	½ drachm

Make ten capsules. Take one every 2 or 3 hours.

PRESCRIPTION 3.

℞.—Carbonate of iron	2 drachms
Sulphate of quinine	5 grains
Extract of opium	¾ grain

Make 20 pills. Take 5 or 6 during the day.

DELIRIUM TREMENS.

Causes.—May arise under two different conditions or circumstances. Where stimulants are suddenly withdrawn from one accustomed to them; and, while their use in excess is continued.

Symptoms.—Sleeplessness, debility, tremors, horror, hallucinations, often with loss of digestive power. The insomnia is a cardinal symptom; if the patient sleeps a whole night he recovers. Debility varies in degree in different cases; in a first attack it is not always great, tremor is nearly always present. The illusions of the patient are wonderfully real, and usually dreadful. He is pursued by demons or beset by moral enemies; he cannot bear to be alone, especially in the dark. Sometimes, however, the visions are indifferent, or even amusing.

Treatment.—If the patient be not much prostrated, give only ale or porter, a bottle or two in the day, with hop tea *ad libitum* and a grain of opium every three or four hours. Very weak patients, accustomed to spirits, might have a tablespoonful of whiskey or brandy every two, three or four hours, according to their condition. Hydrate of chloral sometimes answers as well as, or better than, opium. Digitalis has been used in some cases with great boldness, in doses of half an ounce of the tincture, repeated when necessary in four hours; as soon as the remedy produces its full effect sleep for five or six hours commonly follows. Sleep is the guide to the repetition of the dose.

Diet.—Beef tea and mutton broth, and so forth, seasoned with red pepper, are preferred as diet. In an obstinate case sleep may follow the raising of a blister upon the back of the neck. Substituting valerian for opium, or combining the fluid extract or tincture of valerian with morphia solution answers well in some cases. Injection of laudanum into the rectum is occasionally resorted to. Success in treatment has been obtained from the use of chloroform in doses of one or two drachms. The corrugated stomach of a spirit drinker will probably bear the pungency of chloroform better than anetheis. The large majority of first attacks of mania-a-potu are curable. Third and fourth attacks are often fatal, or are followed by permanent insanity.

PRESCRIPTION 1.

℞.—Indian hemp	10 grains

Divide into 12 pills. Take one every 2 or 3 hours until drowsy.

PRESCRIPTION 2.

℞.—Hyoscyamus	1 grain
Alcohol	1 drachm
Water	1 "

Inject 5 to 10 minims with hypodermic syringe.

INSANITY OR MADNESS.

Causes.—1. This consists chiefly in a particular organization of the brain and nervous system, rendering those individuals so constituted liable to become insane when exposed to the influence of certain agencies, which in other persons either give rise to a different train of morbid phenomena, or are, perhaps, devoid of any injurious effects.

2. Among the agents which give rise to madness there is none more influential than intemperance, or the frequent use of ardent spirits. That the predisposition to madness, when it has once arisen, is frequently transmitted, is a fact too well established to admit of doubt.

3. The exciting causes of insanity may be divided into moral or psychical and physical. The principal psychical are grief, fright, anxiety, care, or an excited state of any passion; the emotions aroused by disappointment, excessive or prolonged employment of the intellectual faculties, and so forth. Anything which will produce a hyperemia of a portion or the whole of the brain by which the nutrition and consequently the normal function is interfered with.

4. The principal physical causes are drunkenness and the use of narcotic or poisonous drugs, want of food, want of sleep and over-exertion; other nervous diseases such as epilepsy, chorea and hysteria; severe injuries to the head, particularly from blows, causing fracture of the skull or concussion of the brain, sunstroke and tumors in the brain. Acute febrile diseases as typhoid, typhus and malarial fevers, and it may occur during the course of pneumonia in the form of acute mania. The poison of Asiatic cholera may so interfere with the nutrition of the brain as to produce not only transient delirium but mania, which may continue several days or weeks. Acute rheumatism is sometimes a cause, chronic constitutional diseases are frequent causes, and among the most formidable

of these is constitutional syphilis. Diseases of the genital organs sometimes exert an important influence in producing insanity.

Symptoms 1.—The earliest symptoms of coming insanity are depressed manner, unusual excitement, anger and rashness.

2. An important symptom in all forms of insanity is impairment of the faculty of attention. The inconsistency of the beliefs of the insane is one of the earliest noticeable symptoms, and they are classed as "delusions" and "hallucinations." A delusion is a false belief in regard to some fact which generally concerns the patient, and which is so strongly rooted that all attempts to reason him out of it are futile. A hallucination is a false perception of one of the senses; the patient may fancy that he sees a spirit or a person who does not exist.

Melancholia.—This may be acute or chronic and is marked by extreme depression of both mind and body. The first stages of melancholia are generally preceded by a condition called hypochondriasis, which may be considered as the mildest form of insanity. There is a feeling of bodily illness at this time more than at any other, or in any other form of insanity.

Treatment 1.—The treatment of a case of chronic or subacute melancholia will vary with its history and symptoms. An asylum is not indispensable if the patient's means are sufficient to provide him with proper care. He may be benefited by travel and change of scene; but when his condition will not admit of this a proper place, either a private house or an asylum, should be selected, and an attempt made by therapeutical and hygienic neasures to restore the cerebral defect by sleep and nourishment of the body.

2. There are three conditions which require constant attention: want of sleep, rejection of food and constipation. To remedy the first chloral is most beneficial. The practical aim is to produce sleep, regularity of the evacuations by laxative medicines and to sustain the strength with nourishing food and wine.

Mania.—There are two varieties, the acute and chronic. In the acute form the excitement is extreme, and follows cosely upon the delusion or derangement of ideas. In the chronic form the delusion or derangement is confirmed but less obtrusive, while the excitement is subdued or comes on at long intervals. Mania has generally a sort of stage of incubation, during which sleeplessness is one of the most important and earliest symptoms. In another class of patients the primary symptoms are those of gloom and despondency, out of which the maniacal excitement appears to develop. In both varieties there is generally a marked departure from the individual's usual state of physical health. The different forms of mania in which the disposition to commit murder, suicide or arson, or to steal, is quite uncontrollable, are well known. When a single tendency of this kind is very prominent the case is usually denominated one of monomania.

Treatment.—The treatment consists in regulating the bodily functions, giving food freely, combined with plenty of drink, also wine, and in the judicious use of chloral. Rest is of the highest importance, and baths of warm water are of great benefit, the head to be kept cool during the operation. Purgatives at the outset of the attack may be of use, as aiding to arrest it.

PRESCRIPTION.

℞.—Fluid extract of conium	1½ drachms
Fluid extract of hyoscyamus	1½ "
Hydrate of chloral	2½ "
Syrup of orange peel	1½ ounces

Take a teaspoonful every 2 or 3 hours, as occasion requires.

Dementia.—Dementia is literally a want of mind, and the word indicates a condition in which there is feebleness of intellectual grasp, or attention, imbecility of word and act and general deficiency of mental power. It is one of the common terminations of both mania and melancholia, and if long continued, its outward signs are a vacant and puzzled look, a lack-lustre eye, a weak smile and a meaningless laugh. This kind of insanity is almost a natural termination of extreme old age and is then called senile dementia. Not infrequently the subjects of it become paralytic.

Imbecility.—Imbecility is a condition in which the mind is from birth unfitted for the active and thoughtful duties of life, and in which the person affected is said to be half-witted, or wanting in general intellectual capacity. This condition of deficient mental development may be associated with moderately good physical health in early life, but there seems to be usually some taint in the system, so that the family of imbeciles is, as a rule, short-lived, the members dying early of consumption, diabetes or some degeneration of the brain and spinal cord.

Idiocy.—Idiocy is a still lower grade of mental weakness, in which the intellectual faculties are below the standard necessary for reasonable life. In the true idiot the head is of a reduced size and the appetites and propensities are very little, or not at all, controlled by reason. Many idiots are deaf and dumb, but most of them retain their sight. The sad condition of these poor creatures may be often ameliorated by systematic training, but complete cure after puberty is hopeless.

Treatment of Insanity.—The treatment of insanity is generally best carried out in asylums for the purpose. To quiet a patient temporarily, or on his way to a suitable institution, bromide of potassium in quantities of thirty grains, or chloral in fifteen-grain doses every two or three hours, morphia by hypodermic injection, or otherwise, and even chloroform by inhalation may be necessary.

CURATIVE MEDICINE.

PART IV.

DISEASES OF THE EYE, EAR AND NOSE.

Importance of Subject.—The diseases of the eye are so important, and serious injury or loss of the organs of vision is such a terrible misfortune, that they demand a careful consideration. For the better comprehension of this group it will be needful, however, to give some preliminary explanations in regard to the eye, and also the ear and nose, with their appendages.

Wonders of the Eye.—The eye is probably the most wonderfully ingenious and complex organ of the human body, and being proportionately delicate, requires to be guarded with the greatest care. Few catastrophes are more grievous than that of total blindness, and most people would rather lose all the other senses than be deprived of sight.

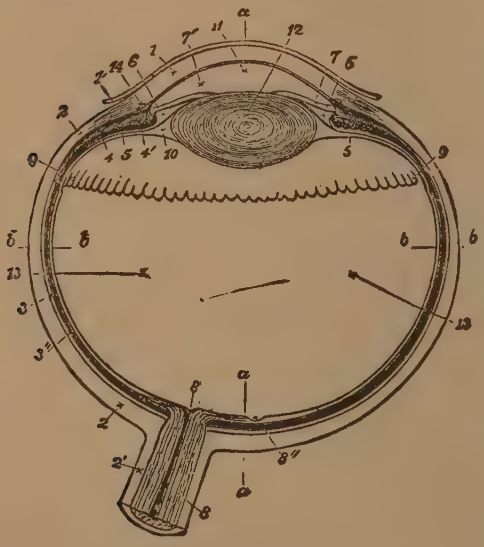
Structure of the Eye.—The intricate structure of the eye may perhaps be best comprehended if we remember that its general plan is that of a photographer's camera, the convex glass in the front of which corresponds with the crystalline lens of the eye, a picture of external objects being formed upon the artist's ground-glass plate in the one case, and upon the retina at the back part of the eyeball in the other.

The Retina.—Now, the retina is simply the expanded optic nerve, which has the peculiar power of perceiving lights or colors, and the chief difference between the eye and the camera is, that in the former temporary impressions only are perceived by the brain, through the optic nerve and retina, and in the latter instrument these temporary impressions are intended to be rendered permanent on the sensitive plate or paper, as a photographic picture.

The Eye Socket.—The eye is carefully protected from accidental injury by being embedded in a deep cavity or socket in the solid bones of the face and head, which guard it jealously from attack on either side and at the back. This socket is much larger than the eye itself, and the bony cavity is filled up behind and at the sides of the eyeball with an admirable cushion and packing of soft fat.

The Cornea.—The eye itself, as can be readily seen in that of a pig or sheep from a butcher's shop, is a white ball almost exactly round, except where the clear circle projects a little in front. This clear part, called the cornea (1), is as transparent as glass, and is set in the space made for it in the white part of the eyeball, very much as a watch crystal is set in its frame. The white portion of the ball, called the sclerotic coat (2), is a tough membrane, very strong and dense, which gives shape to the organ of vision, and protects the extremely delicate structures within. The cornea and sclerotic coat each average about one-twentieth of an inch in thickness.

The Iris.—Inside of the cornea is a circular curtain, with a round hole in the middle, called the iris (7), so named because it varies so much in color, being frequently blue in blonde individuals, and brown or black in brunettes.



Section of the Human Eye.

The Pupil.—The round hole in the centre of the iris is called the pupil, and is the black spot seen on looking into a person's eye. This spot varies in size according to the amount of light, being larger in the shade and smaller in bright sunshine. In human beings it always remains round, unless the iris is diseased, but in the cat, for example, it changes its shape, becoming a narrow slit in a strong light.

Use of the Iris.—This closing up of that curious curtain, the iris, is a beautiful provision for shutting off an excessive amount of light, which would otherwise pass through the pupil in too great quantity, and irritate the sensitive parts of the organ of vision within.

The Sclerotic Coat.—The sclerotic coat is lined on its inside with a thin layer of black membrane, called the choroid coat (3), which seems to have almost exactly the same object as the black lining of the photographer's camera, namely to absorb any extra rays of light, and so prevent the picture from being indistinct.

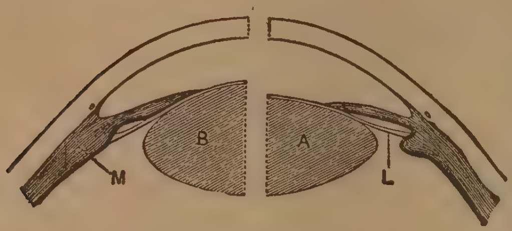
Structure of Retina.—Inside of the choroid coat, and immediately in contact with it, lies the retina, a third hollow ball, made up of an expansion of the optic nerve, which enters the eye at the back (8), through openings in the sclerotic and choroid coats. The retina is made up of several layers, the outermost of which is formed by the terminations of the nerve-fibres in what are called the rods and cones of vision. These rods and cones are so wonderfully sensitive that through them we can perceive the differences of color and outline in the images of objects formed within the eye. They therefore correspond to the sensitive plate in the camera of a photographer.

Other Portions of the Eye.—The remaining portions of the eye are chiefly useful in forming this image of which we take cognizance, and act upon the light exactly as the lenses of an opera-glass or of a camera do, except that they are provided with a more convenient way of changing the focus as may be required. The first of these which the light reaches, after it penetrates the cornea, is the crystalline lens (12).

Crystalline Lens.—This lens can be readily seen by squeezing it out of the eye of a pig or sheep after death, is very much like a large dew-drop or rounded diamond, in size, shape and general appearance, and is solid enough to bear gentle handling. It has the form of a small, thick magnifying glass or lens, and if held over the letters of a printed book, is at once seen to have the same power of making objects seen through it look larger.

Position of Crystalline Lens.—The crystalline lens is placed in the eyeball a little behind the iris, and is large enough to extend out beyond the edge of the pupil, unless that opening in the curtain is wider than usual. If it were not so perfectly transparent we could see the crystalline lens every time we looked a person straight in the eyes, as is shown in cases of cataract, a disease where the lens becomes first milky and then opaque, so that its position can easily be recognized, and the edge of the iris seen to move over it, as the pupil expands and contracts under the influence of varying degrees of light.

Arrangement of Focus.—Every one who has looked much through a telescope, or opera-glass, knows that a different arrangement of focus is needed to show a near and distant object clearly, and that this altered focus is obtained by adjusting the relative position of the component lenses. In the living eye, nature contrives to obtain this necessary effect of two or more lenses with a single one, by making that one (the crystalline) soft enough to change its shape a little, as shown in the diagram, and then providing a muscle called the ciliary muscle (M), through the action of which the lens may become more convex, that is rounded (as at B), and so enable us to see near objects more distinctly. *It is the mechanical effort required to keep this little muscle constantly on the stretch that causes the eyes to feel so tired after long application over reading small print or doing fine work of any kind.* Hence, avoidance of too prolonged a strain of this nature is an important part of the hygienic care of the sight, on account of such a tendency as exists to exhaust the power of this muscle.



Flexible Crystalline Lens.

The Aqueous Humor.—The space between the crystalline lens and the cornea is filled by the aqueous humor (11), a watery fluid bathing the front and back of the iris, which, floating thus in a clear, transparent fluid, has an opportunity to move with entire freedom, and so most perfectly perform its duty as a curtain to shut off any excess of light whenever there is danger of a superabundance injuring the sensitive retina within. The aqueous humor, being shut in by the convex cornea, must, of course, take the shape of that clear membrane, and, forming with it a convex lens, still further aids the crystalline body in bringing the rays of light to a focus upon the retina, and so forming a sharp image upon that sensitive membrane.

Action of Aqueous Humor.—The action of the aqueous humor in this instance is precisely similar to that of water poured into a glass globe standing in the sunshine. Whilst the globe is empty, it has but little effect in concentrating the sun's rays into a focus, but when filled with water, its power as a lens is considerable, and it may even operate so energetically as a burning-glass as to set fire to inflammable substances placed at a proper distance. Want of suitable curvature, and also in many cases the fact of its being curved unequally in different directions, by making the lens or magnifying glass too strong or too weak, has much to do with causing imperfect sight.

Vitreous Humor.—The chief bulk of the eye is made up of the vitreous humor, which receives its name from its vitreous or glassy appearance-

This fluid is contained in the cavity of the retina, and has running through it numerous, fine, interlacing fibres, as transparent as itself, which probably help to prevent the delicate retina from being injured by its shaking about during violent movements of the head and body.

Duty of Vitreous Humor.—The vitreous humor has little or no share in aiding to form the image upon the retina, but does perform an important duty in keeping the globe distended, so that in a sound eye the retina is held at the exact distance, where it can receive images of objects cast upon it in their sharpest and best defined condition.

How to Understand the Eye.—An excellent way to understand fully how the eye acts as an optical instrument, is to actually make a camera of the eye of an ox or other large animal, by cutting away the sclerotic coat at the back part, and then shading this in a small box for instance, so that the images formed by cornea and crystalline lens can be seen inverted upon the translucent retina at the hinder portion of the eye.

Eye Diseases.—The diseases of the eye, according to the nomenclature here followed, are seventy-five in number, so that it is impossible properly to describe the treatment of any but the more important. Among the first of these are to be ranked the diseases of the conjunctiva.

CONJUNCTIVITIS OR OPHTHALMIA.

Character.—This is an inflammation of the delicate membrane over the front of the eye, covering the whole of the cornea, and the part of the sclerotic coat or white of the eye, which is naturally visible.

Symptoms.—The usual symptoms of inflammation can nowhere be observed more distinctly than in the eye; the four great characters of this morbid process, as described by Celsus, about the beginning of the first century, being very apparent. Here, as elsewhere, redness, heat, pain and swelling are the indications of inflammation, just as they were in the days of the old Roman physician, more than eighteen hundred years ago. The redness of the eye in this affection varies with the intensity assumed, but in severe cases it may completely obscure the white of the eye, so that the whole surface, except the cornea, appears quite red. The pain and burning heat of the eye are sometimes almost unendurable.

The Swelling.—The swelling of the conjunctiva is often so considerable as to rise up all round the edge of the cornea, and this projection of the inflamed membrane may be so great as to prevent the eyelids from being closed. Intolerance of light and profuse flow of tears, the latter resulting from irritation sympathetically extended to the lachrymal gland, which supplies those persuasive drops of salt-water, are common symptoms in some forms.

Catarrhal Conjunctivitis.—Catarrhal conjunctivitis or catarrhal ophthalmia, as it is also named, is the form of this affection usually produced by cold. Redness and pain, as if a particle of dust had got into the eye, with a free discharge of water, are the first symptoms. Intolerance of light is not very great, unless the cornea becomes involved. Vision may be slightly obscured, but is seldom seriously affected.

Treatment 1.—The treatment consists of active purgation with calomel (one-tenth to one-fifth of a grain every hour until one to two grains are taken), followed by epsom or rochelle salts. Soothing lotions to the eye, as for example, that of sassafras pith with a very little extract of belladonna to begin with, and, after a day or two, applications of weak solutions of lunar caustic (silver nitrate) should be used.

℞.—Silver nitrate .... 15 grains
Distilled water .... 1 ounce
Mix. Directions:—Apply to the inner eyelids with a little cotton wrapped on a toothpick or a match-stick.

The application should be made once a day for several days, and although the caustic solution smarts severely at first, it leaves, after fifteen or twenty minutes, an astonishing feeling of relief to the affected organ, and in favorable cases rapidly reduces the inflammatory action.

2. To prevent the eyelids from adhering during sleep, and so aggravating the trouble when pulled apart in the morning, an ointment should be used, preferably that recommended by Professor Pegensticker, which is a favorite of most physicians. The formula is:

℞.—Yellow oxide of mercury..................... 1 grain
Vaseline or cosmoline........................... 1 ounce
Mix thoroughly, and apply lightly to inner eyelids night and morning.

3. In many cases "ordinary salt and water or a 2 per cent. solution of boric acid will suffice to effect a cure. Simple conjunctivitis of a chronic nature is often associated with catarrh of the nasal mucous membrane, and may be cured by correcting the catarrh of the membrane." (Professor Weeks.)

Pustular Ophthalmia.—This, called also phlyctænular conjunctivitis and strumous ophthalmia, is the form in which the scrofulous predisposition to disease is very apt to manifest itself in young children. It is almost always accompanied with an eczema of the head or face.

Treatment.—In this affection general treatment for the constitutional disease is the most important. The patient should be placed in the best hygienic surroundings. The eyes should be kept clean with an antiseptic solution, as a 2 per cent. boric acid wash, and the yellow oxide of mercury ointment, mentioned above, rubbed into the eye once or twice daily.

Purulent Ophthalmia.—This is a more violent and contagious form of conjunctivitis, in which the sight is sometimes seriously endangered. The discharge of thick yellow pus or matter is abundant, and the inflammation sometimes progresses with great rapidity.

Treatment.—Active purgation, leeching followed by blisters behind the ears, and application of the stronger solutions of nitrate of silver, are often necessary to preserve the sight. In the contagious variety great care must be taken to avoid conveying the disease from the sick to the well by the use of soiled towels, handkerchiefs, and so forth.

Spread of the Infection.—In bad cases it is probable that the infection may occur by being wafted along in the atmosphere through a large room, or even through a whole house, as is seen sometimes in boarding schools and children's infirmaries.

Purulent Ophthalmia of Infants (*ophthalmia neonatorum*).—This is another contagious form of the disease, affecting new-born children and, if not properly attended to, destroying their sight. It is the result of an infection with the gonococcus which Niesser discovered in 1879 to be the cause of gonorrhea. The inflammation develops in less than three days after birth.

Symptoms.—First there is redness and irritability of the conjunctiva.

2. In about twenty-four hours an excessive secretion of tears and a whitish discharge appears.

3. This is followed later by a swelling of the lids and of the conjunctiva and a change in the character of the discharge from a whitish to a yellow, purulent type.

4. The child suffers very little at first, but later, when the discharge becomes more plentiful and thinner, the patient loses his appetite, is restless and suffers a great deal of pain.

Treatment.—The treatment is divided into two classes. 1. Prophylactic or preventive; and, 2. Curative.

1. That prophylaxis is possible was demonstrated by Credé, a noted obstetrician of Bonn, who reduced the percentage of these cases in the wards of his hospital from 13 per cent. to less than 2 per cent.

Application of the Treatment.—This he accomplished by dropping one or two drops of a 2 per cent. solution of nitrate of silver in the eyes of new-born infants. This procedure is commanded by law in some communities. American authorities only recommend it where the birth canal is presumed or known to be affected.

Analysis of Prophylactic Treatment.—The Cyclopedia of Medicine and Surgery (Gould and Pyle) says: The prophylactic treatment consists:

1. In removing the disease from the mother before labor if possible.

2. Thorough disinfection of the vagina before labor with solution of creolin, carbolic acid, boric acid, salicylic acid, mercuric chloride or other antiseptic.

3. Thorough disinfection of the child's eyes as soon as born.

These precautions should be carried out in all suspicious cases.

2. Curative Treatment.—After the disease has made its appearance, the most strenuous efforts and the most unceasing vigilance and care are demanded to prevent a partial or total loss of sight. Many of the blind we see about us, for whom we feel so much sympathy, can blame their unfortunate condition upon the lack of treatment in the first few days of their lives.

If possible a physician should be summoned at once and his orders followed implicitly, and it may be necessary for him to see the child several times a day to make the necessary applications.

Rules for Treatment.—If a physician can not be had, thorough attention to the following rules will probably result in a cure:

1. Cold applications which tend to lessen the amount of local inflammation.

2. Frequent and thorough flushings of the eyes with mild antiseptics, as boric acid in distilled water.

3. The application of lunar caustic (silver nitrate) ten grains in the fluid ounce of distilled water, two or three times a day.

4. If any ulcers appear on the cornea, weak yellow oxide of mercury ointment should be rubbed, thoroughly but gently, into the lids twice a day.

5. Nourishment, cleanliness and warmth must be maintained.

Diphtheritic Conjunctivitis.—This is a condition of the eye caused by an infection with diphtheria. Fortunately it is extremely rare in America.

Symptoms.—Pain is present, the lids are swollen and hard. The discharge is scanty and may be watery or a thin pus. The constitutional symptoms of diphtheria may be present.

Treatment.—Instillations of very weak solutions of atrophine will relieve the pain. Antitoxin should be administered very early. Otherwise the treatment is the same as in purulent conjunctivitis.

Trachoma.—Granular conjunctivitis or granular lids, is also a contagious disease of the eyes.

Symptoms.—The inner sides of the lids become rough, inflamed, and covered with little projections which irritate the cornea at every movement of the ball or lids. It seriously affects vision, and is often very obstinate, but can frequently be vastly benefited.

Treatment.—1. Perseverance in constitutional treatment.

2. Local applications of nitrate of silver solution, or sulphate of copper to the granulations.

3. Unless improvement follows soon, local treatment should be discontinued and a specialist consulted. There is rarely complete recovery.

DISEASES OF THE CORNEA.

Causes.—Keratitis or inflammation of the cornea may occur from a punctured wound of the eye, or it may be the result of the scrofulous diathesis, or even more commonly of inherited syphilis. It occasionally results in ulceration of the cornea, which sometimes perforates this structure and, allowing the humors of the eye to run out, irrevocably destroys the sight.

Treatment.—Local treatment of the accompanying conjunctivitis and the use of atropia to keep the pupil dilated, so that it, the iris, may not become involved in the inflammation, are important, but the chief reliance must be placed upon constitutional remedies for those general diseases, of which this affection of the eye is little more than a symptom. The white spot or scar left by an ulcer of the cornea is generally permanent, and not only disfigures the organ of vision, but more or less completely obscures the sight for life.

Preventive Treatment.—Since a scar of this kind is so injurious and when once fully formed can scarcely ever be removed, the ounce of prevention is of tenfold importance, and every care should be taken, by securing the most skillful treatment for ophthalmia as promptly as possible, to reduce to its smallest dimensions the danger of such a catastrophe to sight.

DISEASES OF THE SCLEROTIC COAT.

Symptoms.—Inflammation of the sclerotic coat, or sclerotitis, is generally characterized by the intense, deep-seated pain it causes, and by the pink hue of the white of the eye produced. The chief varieties are the rheumatic and the syphilitic.

THE EYE.

Figure No. 1.—Iris, ciliary muscle and coroidea membrane.

1. The pupil.
2. Ciliary muscle.
4. Arteries of the coroidea membrane.

5,5,5,5. Sclerotic tunic, cut circularly and removed.

7. The optic nerve.

Figure No. 2.—Vertical section of the pupil.

Figure No. 3.—Artificial eye.

Figure No. 4.—External muscles of pupil.

1. Part of the sphenoidal bone to which some muscles are attached.

2. 2. External straight muscle.

3. Optic nerve.
4. Internal straight muscle.
5. Upper straight muscle.
6. Lower straight muscle.
7. Upper oblique muscle.
8. Insertion of the upper oblique muscle of the pupil.
9. Lower oblique muscle.
10. Sclerotic tunic.
11. Cornea.
12. Cartilaginous pulley of the upper oblique muscle.

Figure No. 5.—View of the second pair of optic nerves.

1. Globe of the eye. The left, perfect. The right one has the sclerotic and coroïdea tunics removed, showing the retina.
2. Quiasm of the optic nerve.
3. The whitish bodies.
4. The infundible.
5. Varolius bridge.
6. The medulla oblongata.
7. Third pair: motor nerves of the eye.
8. Fourth pair: pathetic.
9. Fifth pair: trigeminous.
10. Sixth pair: external motors.
11. Seventh pair: auditive and facial nerves.
12. Eighth pair: neumogastric, accessory, spinal and glosso-pharyngeal.
13. Ninth pair: hypoglossus.

Figure No. 6.—Lachrymal apparatus (the skin of the eyelid has been removed).

1. Cartilage of the eyelid.
2. Inserion of the eyelashes.

3, 3. Lachrymal ends or openings of lachrymal canals in the eyelids.

4. Conduit to the nose.
6. Cul-de-sac at the orbital extremity of the canal.
7. Lower corner of the eye.
9. Lachrymal gland.

10, 10. Canals carrying tears to the eye

Figure No. 7.—Formation of an image on the retina.

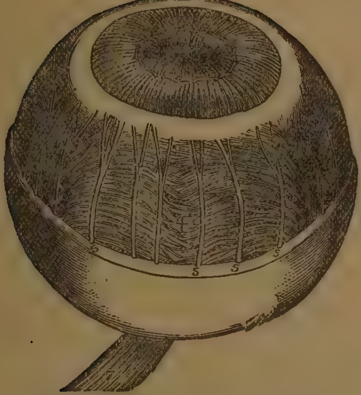


FIG. 1.—The iris, the ciliary muscle and coroidea membrane.

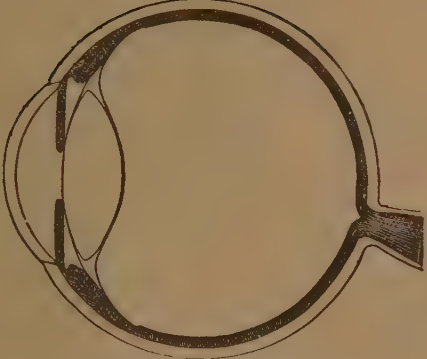


FIG. 2.—Vertical section of the pupil.

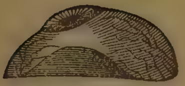


FIG. 3.—An artificial eye.

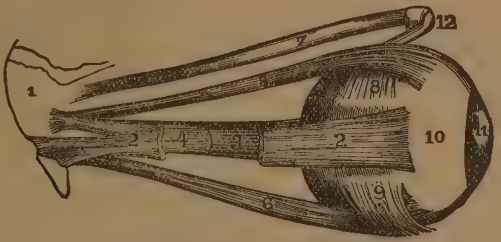


FIG. 4.—External muscles of the pupil.

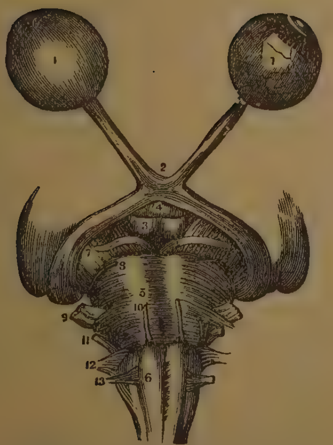


FIG. 5.—View of the second pair of optic nerves.

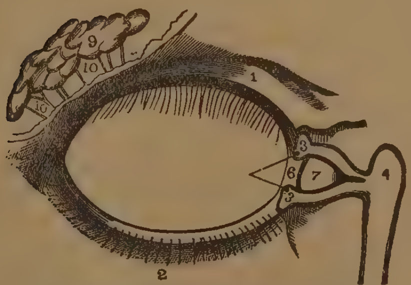


FIG. 6.—Lachrymal apparatus (eyelid skin has been removed).

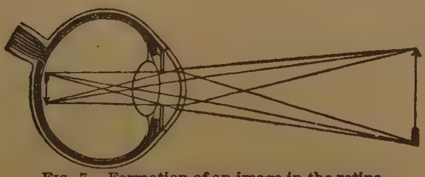


FIG. 7.—Formation of an image in the retina.

THE EYE.

For an explanation of the illustrations see text on opposite page.

Treatment.—The treatment is to be more especially directed towards counteracting by general remedies the poisons of these two virulent constitutional affections.

IRITIS.

Character.—This is an inflammation of the iris, which may be simple or gouty, syphilitic or scrofulous.

Symptoms.—Its symptoms are intense pain in most cases, although in others little uneasiness is felt; change in color of the iris, contraction of the pupil, and impairment of vision. Inflammation of the iris has always possessed a great interest for physicians, because it is the only cavity lined by a serous membrane into which we have the privilege of looking and seeing what is going on when the membrane which forms its boundary is inflamed. Hence, the observation of a case of iritis is not only the most interesting, but also the most instructive, lesson in the sciences of pathology and therapeutics which nature ever vouchsafes to us, as we carefully watch the progress of the disease and the effects of medical treatment from day to day.

Treatment.—Since one of the greatest dangers of iritis is that the pupil will be drawn together by the whitish lymph infused in the inflammatory process, and, by being thus closed, shut off the sight, it is very important to keep this opening of the pupil as large as possible by the use of belladonna, or its active principle, atropia, throughout an attack of iritis. Besides this, general bleeding, or free leeching behind the ears, or on the nape of the neck, followed by repeated blistering, should be employed, and active purgatives with mercury to slight salivation contribute toward the cure. Opium by hypodermic injection to relieve the intense pain, and cool anodyne applications to the affected organ, are valuable palliatives.

RETINITIS.

Character.—This is an inflammation of the retina and seldom occurs alone. It may be due to Bright's disease, may result from a specific taint, or may be of the hemorrhagic variety. This last named condition is nearly always in the aged and is an occasional accident happening in cases where the kidneys are hard and shrunken.

Treatment.—The treatment is of course directed to the disease which causes this inflammation.

CHOROIDITIS.

Causes.—This is also usually in conjunction with systemic diseases, as tuberculosis, syphilis, rheumatism and gout. The suppurative variety may be due to a blow or may be carried from some distant suppurative process.

Treatment.—The treatment is directed to the cause and is mostly general.

AMAUROSIS OR GUTTA SERONA.

Character.—This is a disease of the retina dependent upon various changes of the retinal surface and ending in an inability of the nervous expansion to receive and transmit visual impressions from the outside world to the brain.

Causes—1. It may be produced by exposure of the eye for a longer or shorter period to a white, dazzling object like snow, and snow-blindness is the most familiar example of this affection.

2. It also occurs occasionally from accidents, such as lightning-stroke and blows on the head.

3. It may be due to degenerative changes in the retina following exhausting illness, or connected with sympathetic irritation.

4. Excessive use of tobacco sometimes produces it.

Treatment.—Where the cause of amaurosis can be discovered and removed, some hope of cure may be indulged, but ordinarily the melancholy fate of becoming permanently blind—as the poet Milton was rendered by this malady—awaits the patient. Of course, the earlier treatment is undertaken the better is the chance of arresting the malady before utter destruction of the sight is accomplished.

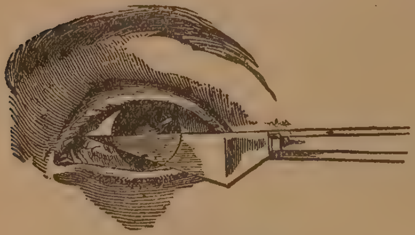
CATARACT.

Character.—This is an inappropriate but long-established term indicating an opacity of the crystalline lens of the eye. In cataract, the lens becomes white and opaque, first at some point on its surface, or in the capsular membrane which envelops the albumenoid substance of which the lens is composed. The opacity extends, until at length the whole of the lens may be involved, and blindness rendered complete.

Development of Cataract.—The development of cataract is usually slow in its progress, except in the case of diabetic cataract, or cataract from a punctured wound, which may form in a few days. The process of becoming totally opaque is called by surgeons the ripening of the cataract, and it is customary to wait for the cataractous change or ripening to be complete before any operation is attempted for its cure.

Causes.—Most frequently there is some change in the vascular system supplying the lens, and to this lack of nutrition is due. Senility, diabetes mellitus, convulsions, injury, exposure and privation are the causes.

Treatment.—No medical treatment, as yet discovered, is of any avail in the treatment of cataract, but the disease may be entirely remedied by the operation of extraction, which is illustrated in the accompanying figure. As there shown, a peculiar, wedge-shaped knife, called a cataract-knife, is used to cut an opening in the edge of the cornea, through which the opaque lens is carefully drawn out, and then the eye closed up and permitted to heal.


Operation for Cataract.

Restoration of Vision.—When successful, as this operation proves in the hands of skillful oculists nearly nine times out of ten, useful vision is restored, and by the aid of very thick spectacles, to substitute the lost crystalline lens, the patient is often enabled to read, write or sew, as well as before being attacked with this disease. This operation of extracting the cataract is generally the most successful with the common form, which occurs in old people, where the crystalline lens is not only opaque, but hardened into a sort of horny substance.

Treatment of Other Forms.—In some of the other varieties of cataract, such as that produced by wounds or other injuries, especially in young people, the treatment by breaking up the lens with a very delicate knife, about the size of a large needle, is resorted to with success. The old-fashioned operation for cataract by couching, or reclination of the opaque crystalline lens, is now generally abandoned, as being much less satisfactory in every way than the process of extraction.

Cataract Often Hereditary.—The tendency to the formation of cataract is often hereditary, but something can be done by hygienic care of the eyes to avert, or at least to postpone, its active development. Since it has been found that operatives who use their eyes opposite to a very strong light—such as glass-blowers—are particularly liable to cataract, it is advisable to avoid such exposure as much as possible.

Effect of Electric Lights.—Very probably electric lights may tend to promote the formation of cataract, unless guarded with special care. It is a curious fact, however, and one which at once disproves the fanciful theory that cataract is a disease of over-civilization and excessive study, that cataracts are frequently met with in animals, especially the horse, where the disease may often be seen in great perfection.

GLAUCOMA.

Symptoms.—This is a disease in which the most prominent symptom is an increase in the tension of the eyeball. By primary glaucoma we mean an increase in tension originating in the eye itself independent of any outside influence. Secondary glaucoma is the same condition due to an injury, some previous inflammatory process, or resulting from valvular heart disease, and so forth.

If the glaucoma is simple in character, the first symptom is partial loss of vision. In cases of inflammatory character pain may be the first feature to attract attention and may be much more severe at times.

Predisposing factors are heredity, excesses of various kinds, gouty or rheumatic tendencies.

Treatment.—Medical treatment is of value in some primary cases. Warm applications may ease the pain, or instillation of one-quarter to one per cent. solution of eserine. Operative measures of various kinds may be necessary from iridectomy to complete removal of the globe.

WEAK SIGHT OR ASTHENOPIA.

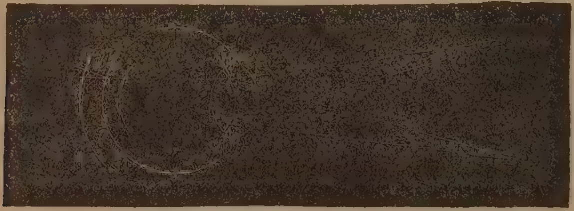
Weak or enfeebled sight, though a term in familiar use, is not easily defined as specially connected with any constant change in the eyeball.

Causes.—It may be due to an irritable condition of the retina, or to an impoverished state of the blood. More frequently, perhaps, it arises from a want of power to keep up the accommodation of the eye for distances, to nervous anxiety about the sight, or to the commencement of one of the serious organic diseases about the eye and its appendages.

Treatment.—Except in the latter case, much can be done by treatment, using general and local tonics, and by care of the eyes in the mode to be pointed out in the next article.

SHORT-SIGHT OR MYOPIA.

Character.—This is a very common condition of vision in which, from the greater convexity or improper position of the lenses of the eyeball, the focus of parallel rays of light does not fall upon the retina, but at some point in the vitreous humor. This error of development, as it often is, will be better comprehended by the aid of the annexed figure, in which is shown a diagram of the eyeball and the course of the rays of light, to form a clear and distinct image of the arrow, on the retina at *b*, *b*. If, however, the eyeball is elongated, so that the retina occupies the position of the line marked 3, as is often found to be the case in near-sighted persons, it is obvious that the rays of light will have passed their true focus, and consequently when they reach the retina in this wrong position can only give a blurred and indistinct image of the object.



The Error in Curvature of Lens.

Remedy.—The remedy for myopia is the use of a concave glass, accurately adapted to the particular eye for which it is employed, and just strong enough to render the rays of light so divergent when they strike the cornea that they will be brought to an exact focus upon the misplaced retina, in its unnatural position, making in this way one error precisely counterbalance the other.

Application of the Remedy.—This remedy should by all means be applied even in early youth, in order to prevent the effort of accommodation, the straining of the eye to see as much as other children do at school and elsewhere, from not only increasing the myopia, but laying the foundation of more serious disease and ultimately, perhaps, destroying the sight.

Increase of Short-Sightedness.—The alarming increase of myopia, and especially its prevalence among young people of both sexes in city schools, must have caused many observant biologists to speculate as to the exact mechanism by which the unfavorable influences of our present civilization were at work so as to bring about this rapid deterioration of the visual organs in the last few generations of mankind.

Myopia Hereditary.—There is no doubt also that myopia is hereditary, and that according to the great law of "the extinction of the unfit," the children of myopic parents are predisposed to the development of this disease. Hence they will almost certainly suffer from it if they are exposed to conditions which would be apt to engender near-sightedness in healthy eyes, free from any taint of hereditary tendency.

Preventive Measures.—Among the general conclusions arrived at by scientists for aiding in this object, so important to the rising generation, the following are worthy of especial notice:

1. In the first place, study-rooms should be well-lighted during the day, and especially toward evening, because a feeble or badly-arranged light compels us to diminish the distance between the eye and the book whilst reading or writing.

2. Light should be allowed to enter from the left side. Illumination from the front is more or less dazzling, and obliges the pupils to bend forward too much, or to sit sidewise in constrained and fatiguing positions. Again, light coming from behind is entirely insufficient, because in great measure cut off by the head and upper part of the body of each scholar.

3. The windows of a school-room should be large and high, and be arranged along the left side of the apartment, so as to shed the light upon desks placed in rows, at right angles to the wall in which the windows are cut.

4. The light from above, furnished by a skylight, is not so good as that derived from lateral illumination. The light of lamps is recommended as being preferable to gas, and the gaslight shining through ground-glass globes is condemned as being particularly objectionable.

5. The inclination of the desk at which the pupil sits to read or write is a matter of no small importance. Desks which are horizontal, or only slightly inclined, favor the development of myopia, by compelling the scholar to bend the head over a good deal whilst reading or writing. Such a position brings on, as a result of mere weight of the blood, passive congestion of the head and eyes, and this in turn results in an intra-ocular tension, insensible, perhaps, when it first appears, but very marked in its effects when long and constantly continued.

Children's School Desks.—Besides, a child who acquires the habit of leaning forward in this manner is very apt to bend nearer and nearer his book, as the muscles of his back become fatigued, and thus, by straining his power of accommodation at short focus, promote the rapid development of myopia. The desks of school children should therefore be sharply inclined at an angle of 40 degrees or 45 degrees when used for reading, and their seats should not be too high, and should be furnished with comfortable backs.

6. Great care should be taken to secure school-books well printed in large, clear type; since those printed in small, indistinct letters, upon bad

paper, with poor ink, as is the case with too many of the classics and the dictionaries in common use, necessitate a close approximation of the eyes to the page, and consequently exaggerated efforts at accommodation, favoring myopia. Furthermore, all punishments of school children which consist in depriving them of recreation or exercise out of doors, or in adding to their amount of study, and consequent employment of the visual apparatus, should be relinquished.

Faults of School Furniture.—The general principles which must be kept in view in the construction of seats and desks for school children, according to the investigations of Cohn and others, may be expressed as follows:

The faults of school furniture which give rise to injurious postures, and so conduce both to myopia and asthenopia, as well as to scoliosis or lateral curvature of the spine, are:

1. Want of, or unsuitable, backs.
2. Too great a distance between the seat and the desk.
3. Disproportion, generally too great a difference between the height of the seat and that of the desk.
4. Wrong form and slope of the desk.

Ideal School Desks.—Dr. Liebreich gives a very clear exposition of the way in which these defects cause the diseases already mentioned, and concludes with the subjoined recommendations, which he considers, however, less advantageous than what he calls the American plan of having the seat and desk made to every child's measure, or the Swiss system, where seven or more different sizes of seats and desks are manufactured to suit the different classes:

1. One and the same size and model of desk should be used for children and grown-up persons of both sexes.
2. The adaptation to the height of each child should be effected by varying the height of the seat and the footboard.
3. The edge of the table is always to be in a perpendicular line above that of the seat.
4. No seat is to be without a back, and the top of this is always to be one inch lower than the edge of the table for boys, and one inch higher than the edge of the table for girls.
5. In all classes where the boys change places the height of the seat is to be regulated in proportion to the average height of the pupils.
6. In all girls' schools, in all those boys' schools where the children do not change places, in boarding schools, and in private school-rooms,

the seat of each child should be accurately regulated in proportion to its height.

Back Support, Etc.—The support for the back should incline only a few degrees from the perpendicular, and be so arranged as to press upon the spinal column just above the hips of the pupil. The breadth of the seat should be considerable, in order to support most of the thighs, and its height just such as to allow the feet to rest easily upon the footboard. The desk should be so arranged, by means of a hinged flap or otherwise, as to hold the book at an angle of 40 degrees or 45 degrees whilst reading, and the paper at an angle of 20 degrees whilst writing is being performed by the scholars.

ASTIGMATISM.

Definition.—This term is applied to a defect of sight due to a difference in the curves of the cornea and crystalline lens in different directions; that is to say, the cornea, for example, may be so curved in the direction of a horizontal line through it as to have a focus of one inch, and be so much less curved on a perpendicular line that its focus in that direction is an inch and a quarter. The result of this different refraction, in different meridians of the globe of the eye, is necessarily an indistinctness of vision, because all the rays of light entering the eye from a bright point are not brought precisely to a point again upon the retina as they should be.

Treatment.—This defect, which is found to be exceedingly common, especially in myopic eyes, can be very accurately corrected by the use of properly adjusted cylindrical glasses, which are so arranged as to distort the rays of light before they enter the eye just enough in a contrary direction to cause them to be brought to an exact focus by the imperfect cornea and crystalline lens of the astigmatic eye.

Use of Spectacles.—Spectacles giving this compensation ought to be procured and faithfully worn, not only because their use will tend to preserve the eyes, which would otherwise be apt to grow strained in the effort to make up for this defect by accommodating the lens, but also on account of the headache which is often the result of such constant effort to adapt the eye to clearer vision.

Day-Blindness.—Day-blindness is a term used to describe a disease in which the person affected can only see when the light is subdued, as in the twilight.

Night-Blindness.—Night-blindness, on the contrary, indicates a condition in which there is indistinctness of vision, except in a bright light.

Causes.—The causes of these two conditions are not very well understood, but night-blindness is known to chiefly affect those who have used their eyes too long and too steadily in a brilliant illumination or who have been exposed to intense or sparkling light.

Treatment.—Rest is the chief means of cure, but prevention of these diseases by the proper protection of the organs of vision by colored glasses, or by the mechanical appliances mentioned when speaking of light, is infinitely preferable.

DISEASES OF THE TEAR APPARATUS.

Character.—The lachrymal gland, which supplies the tears, and is situated at the upper and outer angle of the eye, is subject to inflammation and the usual structural changes which result from that process. The most common disease, however, connected with the lachrymal apparatus is obstruction of the lachrymal duct or tube, which runs from the inner corners of the eyelids down into the cavity of the nose, and conveys the tears into the nasal cavity, which, under ordinary circumstances, they merely serve to keep comfortably moist.

Causes.—This obstruction may result from inflammation of the lining membrane of the duct caused, perhaps, by cold or brought about by acute or chronic inflammations of the nasal chambers. If neglected, abscess may result requiring surgical interference.

Treatment.—In its incipiency attention to the nasal passages and correction of the deformities and catarrhal condition there may suffice to effect a cure of the constriction of the duct. While acutely inflamed, anodyne lotions, as lead water and laudanum, cold or hot applications should be faithfully tried. When dilatation of the duct is demanded it should be continued until a cure is effected.

DISEASES OF THE EYELIDS.

STYE OR HORDEOLUM.

A stye is a little boil at the edge of the lid.

Causes.—When styes recur, refractive errors should be at once suspected and corrected. Ill health favors a stye as it does boils in other localities. Uncleanliness is sometimes the cause.

Symptoms.—These are so well known that it is not necessary to go into them. Suffice it to say that when a yellow spot is discernible on the stye, it is ripe and should be opened.

Treatment.—To hasten the pointing of a stye, apply hot compresses for fifteen minutes every two hours. Tonics are indicated in the debilitated; glasses—properly fitted—should be worn, and a boric acid eyewash used until long after the stye has disappeared.

WILD HAIRS OR TRICHIASIS.

Dangers.—This is the name for that growing in of the eyelashes, commonly known as wild hairs in the eye. Even one of these hairs, by rubbing upon the sensitive cornea whenever the patient winks, may cause much irritation and even injury to the sight.

Treatment.—Temporary relief is afforded by pulling out the offending hairs with small tweezers, but often a surgical operation is necessary to accomplish a permanent cure.

SQUINTING OR STRABISMUS.

Character.—This disease is the commonest of the derangements of the eyeballs within their orbits. In it the eye is involuntarily drawn from its straight position to one or the other side, so that the natural and agreeable parallelism of its axis with that of its fellow is not maintained. When the eyes are turned in toward the nose, as is more commonly the case, the strabismus is called *convergent*, and when the squint is outward, it is spoken of as *divergent* strabismus.

Causes.—This defect is due either to shortening of one of the six little muscles by which the eyes are moved in their sockets, or to the spasmodic contraction of one of these muscles, or to paralysis of one of them and relative over-action of its natural opponent. Strabismus is in some cases an acquired affection, and may even result from the bad habit among children of imitating deformities of this kind. More frequently it appears to be the product of hereditary tendency. It may affect both eyes in the same person, and even in the same direction, and is then called double strabismus, or it may be confined to one eye, the other remaining perfectly healthy.

Treatment.—Something can be done in the treatment of this malady when it first commences in children who are not too young to wear spectacles by having these arranged with half pieces of black glass, so that the patient is compelled to look straight forward. But the simple operation of cutting through a part or the whole of the contracted muscle is in suitable cases the best remedy, and often, not always, proves perfectly successful in removing the deformity.

THE EAR AND ORGANS OF HEARING.

Figure No. 1.

1, 2, 3. The inner cavity open, showing the spiral lamina.
4, 5, 6. Rest of the cells of the inner cavity.
7, 8. Vestibule.
9, 10. Upper canal.
11, 12. Lower canal.
13. Outer canal.
14, 14. Semicircular membranous canal.
15,16,17. Acoustic or auditive nerve.

Figure No. 2.

1, 2. Origin and end of the helix.
3. Antihelix.
4. Antitragus.
5. Tragus.
6. Lobe of the outer part of the ear.
7. It points to the navicular pit, and is in front and over the wing.
8. Shell.
9. Outer auditive duc.

Figure No. 3.

1. Swelling of the upper semicircular canal.
2. Swelling of the outer canal.
3. Swelling of the lower canal.
4. Upper semicircular membranous canal.
5. Outer membranous canal.
6. Lower membranous canal.
7. Spaces between the semicircular membranous and bony canals, supposed to be filled with coatunni humor.
8. Common duc formed by the union of upper and lower membranous canals.
9. Place where the inner semicircular canal opens into the elliptical urn of the vestibule.
10. Elliptical urn which contains the:
11. Breschid otocones.
12. Spheric urn containing also some:
13. Otocones.
14,15,16,17,18. Expansions of the acoustic nerve to the membranous canal and the elliptical urn, and also the spheric.
19. Turns of the spiral lamina.
20. Ladder of tympanum.
21. Nervous expansion to the back swelling.
22. Vestibule ladder.
23. Modiolum.

Figure No. 4.

1. Thickness of outer covering of inner cavity.
2, 2. Vestibule ladder or upper cover of the spiral lamina.
3, 3. Tympanum ladder or lower cover.
4. Hook of the inner cavity.
5. Centre of the infundible.
6. Round opening communicating with the tympanum.
7. Thickness of the outer cover of the vestibule.
9. Oval opening.
10. Orifice of the aqueduct of the vestibule.
11. Lower semicircular canal.
12. Upper semicircular canal.
13. Outer semicircular canal.
14. Swelling of the lower canal.
15. Swelling of the upper canal.
16. Common orifices of upper and lower canals.
17. Swelling of the outer canal.

Figure No. 5.

1. Normal size. The other is much enlarged.
2. Zone of acoustic nerve.
3. Arrangement of filaments in the vesicular zone.
5. Membranous zone.
6. Bony texture of the modiolus.
7. Opening between the two ladders.

Figure No. 6.

1, 1. Zone of the acoustic nerve.
2, 2. Filaments of the same in the bony zone.
3, 3. Anastomosis in the vesicular zone.
4, 4. Membranous zone.
5, 5. Fold of outer edge.
6, 6. Axis of inner cavity.
7. The mediolus.
8, 8. Outer bony walls of the inner cavity.
9, 9. Bony layers of the spiral lamina.
10. Vestibule ladder.
12. Hook of the inner cavity.
13. Infundible.
14. Horse hair passed through the course of the spiral lamina.

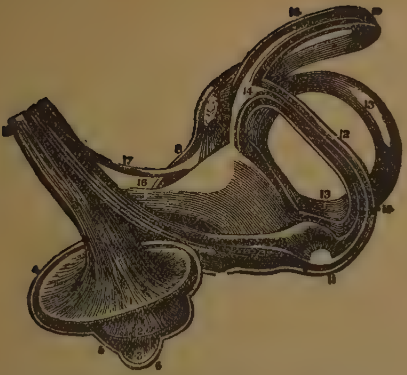


Fig. 1.—View of the labyrinth in a straight position, open to show the distribution of the nerves.

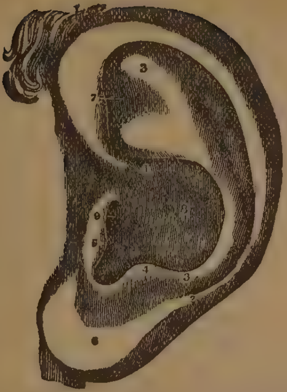


Fig. 2.—View of the left ear in its normal state.

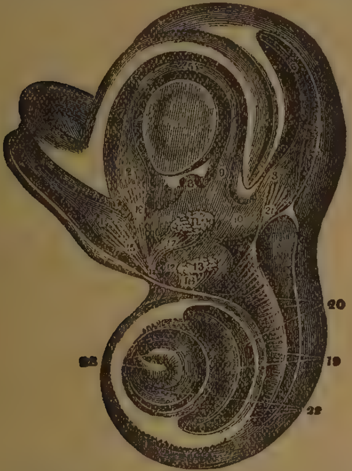


Fig. 3.—View, very much enlarged, of the external phase of the bony labyrinth of the left side, open, exposing the vestibule and its contents, etc.

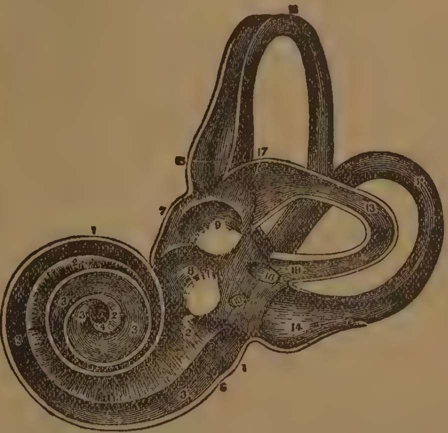


Fig. 4.—View of the labyrinth on the left side, open throughout, in order to show its structure—enlarged.

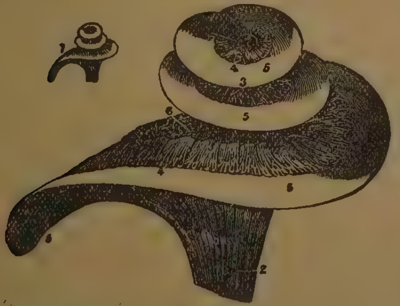


Fig. 5.—Figure or imaginary plan of the inner cavity of the ear.

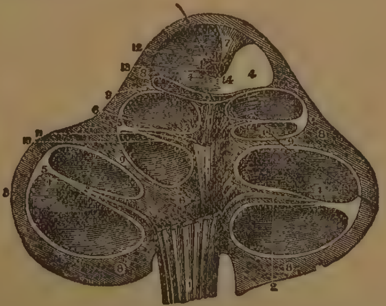


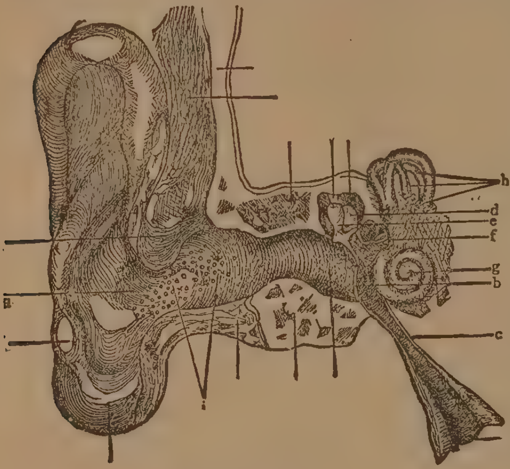
Fig. 6.—Vertical section of the inner cavity of the ear, very much enlarged, showing the arrangement and connection of the different parts.

THE EAR AND ORGANS OF HEARING.

For an explanation of the illustrations see text on opposite page.

DISEASES OF THE EAR.

Number of Diseases.—The number of diseases of the ear is **twenty-four**, but as a majority of them require for their recognition and effective treatment more or less peculiar and costly apparatus, only a few of the most important require notice in this chapter. For the understanding of these, however, a brief review of the anatomy of the ear is necessary.



Section of Right Ear.

Anatomy of the Ear.—The external ear, or auricle, as anatomists call it, is supposed by many people to be the chief part of the organ of hearing, but in reality the essential pieces lie inside the head, some, indeed, imbedded in the most solid bone of the skull, and one so hard that it is has received the name of the *petrous* or rocky portion of the temporal bone.

Auditory Canal.—Besides the auricle, which is all that portion of the ear projecting from the head, the external ear is considered by anatomists to include the auditory canal (a) or opening into the head, and the delicate tympanic membrane or drumhead (b), which is drawn across the auditory canal like a curtain, at a depth of about one inch and a quarter from the outside.

The Ear Drum.—The middle ear, as it has been named, called also the drum of the ear, is bounded outwardly by the tympanic membrane, and inwardly by the bony portion of the labyrinth or internal ear. It includes the Eustachian tube (c), which is a fleshy pipe, communicating through the head with the upper and back part of the throat, and it contains the ossicles or little bones of the ear (d, e, and f).

Ossicles or Little Bones.—These ossicles are three in number, and are named from their resemblance to the familiar objects after which they are called—the hammer (d), the anvil (e), and the stirrup (f). These remarkable little bones play a curiously elaborate part in the mechanism of hearing.

The Labyrinth.—The chief portions of the internal ear, or labyrinth, as it is often called, on account of its perplexing structure and function, are the cochlea or snail-shell (g), and the semicircular canals (h). The appearances of these are sufficiently indicated by their names, and their positions can be best understood by looking at the adjoining picture.

Use of the Auricle.—The object of the auricle in man is to collect the waves of sound, just as the broad mouth of an ear-trumpet does, and it seems to have no other duty in the process of hearing. In order to prevent, as far as possible, the entrance of insects with the sound-waves into the auditory canal, the exterior opening of this tube is guarded by stiff, coarse hairs.

Ear-Wax.—It is also generally covered with a sticky, bitter substance, the ear-wax, secreted by numerous ceruminous glands (i), apparently to stop, or disgust, any adventurous creatures which may attempt to make their way in toward the drum. This provision is highly necessary, because the tympanic membrane is so exceedingly sensitive that a very slight touch, even from the foot of a small insect, would cause intense pain.

Delicacy of the Drum.—On account of this great delicacy of the membrane of the drum, it is unsafe to put any hard object into the ear for the purpose of cleansing it. Hence, the corner of a towel is far better to wipe out the ear with than an earpick or any other solid instrument.

Wax Plugs.—Sometimes a firm plug of wax accumulates in the external auditory canal, and causes deafness, which, however, can be entirely and immediately cured if the hardened wax is removed by syringing with warm water.

Foreign Objects in the Ear.—When children put beads, grains of corn, and so forth, into their ears, no attempt should be made to pick them out with hair-pins or bodkins, lest, on the contrary, they be pushed further down the tube. It is much wiser to send for a physician, who is provided with suitable, delicate forceps, for removing them without risk of such a serious addition to the original misfortune.

Insects in the Ear.—If an insect makes its way into a person's ear, notwithstanding nature's safeguards against such an accident, the patient should at once lie down on the opposite side and have the affected ear filled up with sweet olive oil, which will probably kill the creature and cause it to float up to the mouth of the auditory canal, where it can be picked out.

Office of Auditory Canal.—The office of the auditory canal is to convey sounds, after they have been collected by the auricle, to the drum-head, which is caused to vibrate just as that of a soldier's drum does when it is beaten, or rather as the sounding-board of a piano does when the keys are struck. The vibrations thus produced are transmitted along the chain of ossicles, that is to say, the handle of the malleus or hammer, being fastened to the tympanic membrane, moves with it. In thus moving, it tilts the incus or anvil slightly over, and this motion of the anvil in its turn causes a slight oscillation of the stapes or stirrup.

The Stirrup.—But the stirrup is fastened by its foot-plate to the membrane covering a little hole in the bony wall of the labyrinth, called the oval window, so that any vibration of the drum-head or tympanic membrane is carried along over this chain, or bridge of bones, to the covering of the oval window. Behind this latter membrane the whole labyrinth is filled with a watery fluid, which bathes the terminations of the auditory nerve in the cochlea.

The Semicircular Canals.—The exact use of the semicircular canals is not understood, but there is little doubt that the fine hairs proceeding from cells found in the cochlea are thrown into vibrations by undulations transmitted from the membrane of the oval window through the fluid contained in the cavities of the labyrinth. Then these vibrations of sound are perceived by the delicate nerve-fibres, in which the auditory nerve terminates, very much as the undulations which constitute light and color are perceived by the filaments of the optic nerve, where they terminate in the rods and cones of the retina. Obviously, with such a complicated and excessively delicate mechanism for carrying on the process of hearing, the wonder is, not that few people hear imperfectly, but that everybody is not as deaf to all sound as the world has been in previous ages to the teachings of hygiene.

DISEASES OF THE AURICLE OF THE EAR.

Ear Tumors.—This outer part of the ear is the occasional seat of gouty and other deposits, which give rise to prominences and irregularities of its surface; it may also be affected with a kind of vascular tumor called hæmatoma, and still more frequently be the seat of benignant and malignant or cancerous tumors, and of various malformations.

Sizes of the Ear.—In persons of slight and delicate organizations, with a scanty stock of vitality, the outer ear is often exceedingly small although it may be perfectly shaped. In persons of large build and actively circulating blood, the auricle is sometimes relatively large, the lower lobe being pendulous and of exaggerated development.

What Large Lobes Indicate.—As a rule, a large lobe of the ear indicates a free vascular supply of blood to the brain, and is said to be to some extent a sign of epilepsy, and of other kindred nervous diseases.

Danger from Earrings.—If people choose to run the risk of suffering from the dangerous little tumors which are sometimes caused by the barbarism of wearing earrings, they should be very careful to diminish the chance of injury as much as possible by having the auricle pierced with a clean, bright instrument, and by preventing the cartilage, which sometimes comes quite low down in the lobe of the ear, from being wounded.

Boxing and Pulling Ears.—Children should never be punished by "boxing" or pulling the ears. The former piece of brutality might instantly burst the tympanic membrane, causing deafness for life, and the latter is liable to originate severe inflammation of the auricle, leading to the same unfortunate result.

ECZEMA OF THE AURICLE.

Symptoms.—The symptoms of this affection are the same as of acute eczema and the reader is referred to the article on that subject. There is also a chronic form in which the skin is thickened and crusts are formed.

Causes.—1. Detention, when it is due to nerve-irritation.

2. Discharges from the ear which irritate the auricle.

3. Hoods by pressing the auricle against the side of the head and preventing the evaporation of the perspiration.

4. A chronic form sometimes found in old people is due, likely, to a weakened "tone" of the tissues.

Treatment.—The treatment is the same as in eczema of other parts of the body. Where it is possible, the cause should be removed. Cleanliness is essential but water is contra-indicated and the crusts should be removed by olive oil. The ammoniated mercury ointment, which is official and to be had at all drug stores, should be applied twice daily after thorough cleansing. Cod-liver oil and iron are often of use as internal remedies.

HEMATOMA OF THE AURICLE.

Definition.—This is a swelling of the auricle in which there is an infusion of blood between the cartilage of the auricle and the perichondrium. It is frequently caused by traumatism and often occurs in the insane.

Symptoms.—The symptoms are swelling and slight pain.

Treatment.—Gruber recommends, if the blood is coagulated, incising the tumor and removing the clot. Painting with tincture of iodine is advised for the thickening. Cold or warm applications may be tried to relieve the pain.

DISEASES AND AFFECTIONS OF THE AUDITORY CANAL.

BOILS OR FURUNCULOSIS.

Character.—This is one of the most painful maladies that flesh is heir to. It is rendered so frightfully painful by the fact that it is shut in between a layer of strong cartilage and solid bone. Probably the most common cause of abscess in the ear is taking cold, although picking the ears with hard, sharp instruments sometimes seems to excite it. As it is impossible to tell which side of the auditory canal the abscess is going to form, early in the case, lancing must be deferred.

Treatment.—As a rule, all that can be afforded in the way of relief, is gained by hot poultices made out of ground flaxseed, bread and milk, or little bags of hops dipped in hot vinegar and changed very frequently, or as soon as they grow cool. As soon as the abscess is well localized it should be opened by a physician, thereby relieving the patient of a great deal of suffering. In the meantime some respite and sleep may be obtained by the use of opium suppositories containing one grain each used every four hours, or hypodermic injections of one-eighth to one-half of a grain of morphia.

BONY TUMOR OR EXOSTOSIS.

Causes.—An exostosis or bony tumor occasionally springs from the walls of the auditory canal, pushing the mucous lining before it, and filling up part or all the calibre of the tube. It is most frequently met with in people of a rheumatic or gouty tendency. Until chiseled away, it is sometimes very painful, and a serious obstacle to hearing.

WAX OR IMPACTED CERUMEN.

Causes.—This is the name given to that condition in which the canal is partially or completely filled with ear-wax. The wax may be very hard and may be mixed with dirt and dust. It is caused sometimes by the shape of the canal, and on the other hand is often due to one's occupation.

Symptoms.—Deafness, dizziness and buzzing in the ear are frequently complained of, but to make sure that impacted wax is present it should be seen. It appears as a dark mass in the canal.

Treatment.—If the wax is soft, it may be removed by repeated syringings with warm water. If it is hard, the canal should be filled with warm olive oil and then the syringing tried. An instrument of any kind should never be introduced into the canal for its removal by the unskilled hand.

FOREIGN BODIES IN THE EAR.

Symptoms.—Inanimate foreign bodies, such as beads, buttons, grains of corn, etc., give rise to the same symptoms as impacted wax. In the case of grains, water tends to swell them and so makes their removal more difficult. In such cases the surgeon should be called upon.

Use of Syringe.—Insects occasion great pain which may simulate intense neuralgia, or, by a reflex action, may refer the pain to the teeth and so lead one astray. The syringe should be used and hot water is very grateful to the patient, soothing the inflamed part.

DISEASES OF THE TYMPANIC MEMBRANE OF THE EAR.

EARACHE.

Character.—Inflammation of the drum-head is an acutely painful affection, sometimes attended with fainting fits in its early stages, and usually resulting in deafness because the membrane is left thickened, and therefore incapable of properly responding to the vibrations of sound.

Treatment.—Leeching, followed by blisters behind the ear, or on the nape of the neck and opium internally or hypodermically, to mitigate the suffering, which is often very severe, will prove of great value. Hot applications to the ear in the shape of bags of hops, a stove lid wrapped in flannel, or the hot-water bottle may be sufficient to give relief.

Treatment of Children.—In young children a hot foot bath will relieve by dilating the small blood-vessels of the lower extremities and so drawing some blood from the inflamed area. As hot water as can be borne may be dropped into the ear. With the best of care we will frequently be rewarded by

PERFORATION OF THE TYMPANIC MEMBRANE.

Causes.—This is especially liable to occur during the course of scarlet fever from suppuration of the middle ear, and if neglected leads to permanent deafness. Hence, in scarlatina, the ears of a child should be carefully examined daily with the little conical ear-speculum, if there is the slightest complaint of pain in them, in order to prevent this disaster by early puncture of the drum-head, which allows the escape of the imprisoned pus, and so saves the organ of hearing. Still, when the perforation remains in the drum-head the auditory sense is often only slightly impaired.

Treatment.—Suppurating or running ears need, above all things, that cleanliness should be maintained as much as possible. If pus remains in the middle ear, a chronic inflammation is kept up and normal tissue is destroyed—eaten away as one might say. Hearing becomes more and more difficult and life is constantly in jeopardy, for the bone may become affected and the brain finally exposed to infection and a brain-abscess develop. Cleanliness may be maintained usually by washing out the ear with a hot solution of carbolic acid two or three times daily. A two per cent. strength is sufficient. If this fails to cure the ear, which would be evidenced by a cessation of all symptoms, especially pain and discharge, a specialist should be at once consulted. Dead or necrosed bone may be present, or granulation tissue—"proud flesh,"—and should be removed as soon as possible.

Thickening of Tympanum.—Thickening and condensation of the tympanic membrane are liable to occur in advanced life, the delicate skin forming the drum-head undergoing a slow process of change, by which it loses its elasticity and becomes firm and hard almost like the nail of the finger. Of course, in this condition the vibrations into which it should naturally be thrown are rendered very imperfect, and the hearing is correspondingly defective in old people who are the subjects of this degeneration.

DISEASES OF THE EUSTACHIAN TUBE.

Causes.—The Eustachian tube is liable to inflammation from extension of disease from the throat, even such a simple irritation as that of a common cold. It is also subject to obstruction and contraction, so that the air cannot pass freely through it into the cavity of the tympanum, as it should do in health. When this takes place, the vibration of the drum is interfered with, there is pressure within the cavity, and consequently a sense of fullness and deafness is experienced, which is very oppressive.

Treatment.—This distressing condition can often be greatly relieved by calling in a skillful aurist, who may pass a probe or hollow tube along the Eustachian canal into the middle ear, and so restore the communication of the latter with the external air.

Diseases of the Middle Ear.—Diseases of the middle ear and of the internal ear comprise inflammation, ulceration and abscess. All these are very painful, difficult to recognize with certainty, and, as a rule, beyond the power of any but the most skillful treatment. In every case an experienced aurist should therefore be immediately called in, and until he arrives the severity of the pain may, perhaps, be held in check by some of the means suggested when speaking of abscess of the auditory canal.

DISEASES OF THE NOSE.

Anatomy of the Nose.—The organ of the sense of smell is much more extensive than people who have never studied anatomy imagine. Instead of being merely a triangular projection of some two or three inches long, and an inch or an inch and a half high, occupying the middle of the face, it is a large double cavity reaching far back into the head, and communicating by the posterior nares or hinder nostrils with the upper part of the throat. The external portion of the nose is composed at its upper third of small bones, which are continued at its lower part by plates of cartilage.

Nose Bones and Cartilages.—These cartilages and bones are covered on the outside with a thin skin, and on the inside with a mucous membrane, which in the deeper recesses of the cavity is identical and continuous with that of the mouth and throat. The external division between the two nostrils is carried upward and backward by a flat, very thin bone named the vomer; and the sides of the two cavities, which are continuous with the exterior nostrils, are partly filled up with soft, spongy processes of bone, three of which are called the turbinated bones, because they are rolled up like a scroll.

The Mucous Membrane.—These turbinated bones are covered, like the rest of the nasal cavities, with a mucous membrane, named the Schneiderian membrane, richly supplied with blood-vessels, which approach very near its soft and delicate surface. It is from these small, but active, little blood-vessels that the hemorrhage usually comes in bleeding from the nose.

The Olfactory Nerves.—The nerves of smelling, called the olfactory nerves, enter the upper part of the nose through openings in the sieve-like bone, which forms the roof of the nasal fossa. After passing into the nose, these olfactory nerves divide up into a great number of tiny branches, which run along under the surface of the Schneiderian membrane, and are spread out upon the superior and middle turbinate bones, and on the sides of the partition between the two nasal cavities. The great use of the turbinated bones and processes is to furnish a large extent of surface upon which these branches of the olfactory nerve can be expanded.

Functions of the Olfactories.—And this spreading out of the olfactory nerve is evidently in order that the sensitive filaments may, on occasion, come in contact with as large a number as possible of the exceedingly minute, odorous particles which many substances, such as musk or camphor, are constantly giving off in such abundance.

How We Smell.—These odorous particles have the power of affecting the terminal filaments of the olfactory nerves in different ways, which we recognize as the agreeable or disagreeable odors of the objects from which they originate. The excessive minuteness of such particles may be comprehended from the fact that the apartment of the Empress Josephine in one of the French Imperial palaces was found, after twenty-four years of disuse, to give off a distinct odor of the musk employed by that unfortunate lady when she occupied it.

Uses of the Sense of Smell.—The power of distinguishing odors, which to some animals, including all those beasts which pursue their prey by scent, is one of the most vitally important, chiefly serves as a means of gratification or its opposite to human beings.

Hygienic Office of Smell.—But although the sense of smell does not in civilized communities contribute anything toward sustaining life by helping us to secure food, it has a very useful hygienic office, which should never be forgotten, in guarding us against some of the most common and dangerous causes of disease, in foul air and polluted water.

Nose as a Warming Organ.—Besides this the nose has an important work to do in warming and, to some extent, purifying the air we breathe, as that air is drawn through the narrow and winding passages among the turbinated bones. The Schneiderian membrane over which this air passes being generally moist, and more or less covered with adhesive mucus, helps to catch not only the odorous particles, but larger and more hurtful impurities, and so is quite mechanically a valuable protector to human health.

NOSE BLEED OR EPISTAXIS.

Causes.—Nose bleed may be due to a blow, picking the nose, the presence of a foreign body in the nose, or to the use of instruments in the nose. Diseased conditions within the nose often occasion it. In girls it may replace the natural menstruation. Diseases of the heart, liver and kidneys may give rise to it.

Treatment.—In cases of slight bleeding, pressure or the snuffing of ice-water may suffice. If these fail, cotton dipped in a one to ten thousand solution of adrenalin, should be packed into the nostril and kept there for ten or fifteen minutes. Iron, tannic acid and alum—the remedies our grandmothers used, are now supplanted by this modern drug which does not irritate the delicate lining of the nose as the old remedies did. If the adrenalin solution does not check the hemorrhage, it may be necessary for the physician to plug up both the anterior and posterior nostrils by the aid of an ingenious little instrument which has been devised for that purpose.

NASAL CATARRH.

Forms and Causes.—"Catarrh" is a word derived from the Greek word *katarheo*, meaning to flow down, and is used in medicine to designate a particular form of inflammation of the mucous membrane. It has many forms and is due to many causes, and no one has ever found nor ever will find one remedy for "catarrh." This truth should be better and more generally known by the intelligent public.

Causes.—As causes of "catarrh" may be mentioned:

1. Climatic influences. Many patients lose their catarrh when they change from one climate to another.

2. Inherited predisposition. One cannot inherit catarrh, but the weakness of the mucous tissues may be inherited and so predispose to the affection.

3. Indigestion, constipation, intestinal parasites (worms), heart, lung, liver and kidney diseases are often provocative of a catarrhal state of the nasal mucous membrane.

4. Many fevers at their beginning or during their course are accompanied by acute catarrhal disturbance. Typhoid fever, measles and scarlatina are examples.

5. Deformity within the nasal chambers is one of the most frequent factors, and local remedies are of no avail as far as a permanent cure is concerned. In these cases the only sensible treatment is the correction of the deformities, thus bringing the organ into a condition as near the normal as possible.

Catarrh as the Cause of Tuberculosis.—There is a general belief that catarrh is to blame for the great majority of the cases of consumption. This needs some modification before it is to be accepted. Surroundings, family predisposition, climate, and weak, non-resisting tissues are as much to be blamed for the occurrence of this terrible malady. Catarrh does, however, play some part as a factor.

Liability of Infection.—Professor Osler, of Johns Hopkins University, says on this subject: "The liability of infection in the cervical and bronchial glands in children is probably associated with the common occurrence of catarrhal processes in the throat and bronchi." This means that neglect of catarrhal conditions in a child makes that child more likely to be infected with tuberculosis, and if the family has a history of tuberculosis there is all the more reason for thoroughness of treatment of the existing catarrhal condition.

Dr. Lartigau's View.—Dr. Lartigau, of New York, in his article on tuberculosis in the *Twentieth Century of Practice of Medicine*, under predisposing conditions mentions susceptibility to catarrhal inflammations.

FETID CATARRH OR OZENA.

Character.—This is a term applied to a form of catarrh characterized by a horrible and peculiar stench and the formation in the nose of crusts of dried secretions upon which the fetor depends.

Causes.—In some cases it is due to a constitutional disease, as syphilis. In the majority of instances, however, it is the continuation of a catarrhal inflammation, in which the mucous membrane shrinks—atrophies—and the secretions therefrom are changed, becoming more tenacious and concentrated.

Symptoms.—These are the crusts and the peculiar fetor mentioned above.

Treatment.—Cleanliness is the great *sine qua non*—a fact easily remembered when one realizes that the fetor is from the decomposing crust. To detach the crusts various washes have been prescribed. A solution of bicarbonate of soda is a good solvent and may be prescribed as follows:

℞.—Bicarbonate of soda	2 ounces
Common table salt	1 ounce
Menthol	4 grains

Mix. Directions: Half a teaspoonful in a cup of warm water, snuffed up the nose until the nostrils are clear. Use twice daily.

Or

℞.—Bicarbonate of soda	2 ounces
Biborate of soda	½ ounce
Salicylic acid	1 drachm
Menthol	4 grains

Mix. Directions: Same as for preceding prescription.

Or

℞.—Dobell's Solution.

Dilute with three or four parts of warm water and use as a nose wash.

Steam Inhalations.—If these washes are not effectual in removing the crusts, steam or hot vapor inhalations may be tried. In obstinate cases it is often necessary to remove the crusts with some force, either with cotton on a probe or with forceps. After the crusts are gotten rid of, antiseptics and deodorizants should be employed. Weak solutions of potassium permanganate, bichloride of mercury, and when the patient can stand the pain, a one-half to a one per cent. solution of formaldehyde.

Removal of Dead Bone.—When the fetor is due to dead bone, the dead bone should be at once removed.

Treatment of Syphilitic Catarrh.—If a syphilitic taint, either inherited or acquired, is the foundation of the odor, proper constitutional treatment should be instituted at once and maintained until long after the nasal symptoms have disappeared.

GRAPE-LIKE TUMORS OR NASAL POLYPS.

Causes.—Nasal polyps are grape-like tumors which are dependent from the upper and outer wall of the nose—on the inside—and are supposed to be one of the possible results of chronic inflammation of the lining mucous membrane. They are rarely seen before the fifteenth year.

Symptoms.—When small they may present no symptoms. If they are large, they may cause obstruction to the respiration, pervert the nasal secretions, cause headaches, give a nasal twang to the voice, and, in some cases, undoubtedly provoke asthmatic attacks.

Treatment.—The treatment is removal, which may be accomplished by twisting the tumor free from its attachment, by cutting it at its base, or preferably by using a wire snare.

ACNE ROSACEA.

Nature.—This is a skin disease affecting usually the skin-covering of the nose, is chronic, and is characterized by redness, thickening of the skin, and more or less acne.

Causes.—These are various. According to Prof. Van Harlingen, "in early life it is generally due to anemia and debility, nervous prostration or dyspepsia. In later life the use of spirituous liquors is often the cause, and, perhaps nearly as often, dyspepsia in some of its forms." In women, disturbances of the menstrual function, even pregnancy, may act as a causative factor.

Treatment.—To be successful persistence in treatment is often necessary. The first thing to be done is to remove the cause. "Uterine and menstrual derangements are to be looked after, the stomach and bowels kept in good order, and all hygienic measures used to improve the general health. Alcoholic and malt liquors are to be totally eschewed. Tea and coffee should be drunk in moderation and not strong. Inveterate tea drinkers are very apt to have red noses."

The Favorite Drug.—The favorite drug both for internal and external use in this disease is ichthyol. Internally it may be administered in peppermint water, equal parts of each, ten drops being the dose and given every four to six hours. Locally it may be used as an ointment or as a paint:

℞.—Ichthyol	1 drachm
Subnitrate of bismuth	1 "
Ammoniated mercury	1 "
Vaselin	10 drachms

Mix. Apply freely before retiring. (Dr. Latoir.)

℞.—Ichthyol	1 ounce
Oil of eucalyptus	10 drops
Oil of bergamot	5 "

Mix. Paint on at night; wash off in morning with soap and warm water; then apply dusting powder. (Merk.)

Vleminck's solution is recommended by Stelwagon, diluted one to ten parts of water. The formula for the strong solution is:

℞.—Calcis	½ ounce
Sublimed sulphur	1 "
Water	10 ounces

Boil down to six ounces and filter. Apply locally three or four times a day.

ADENOID GROWTHS.

These growths resemble proud flesh. They grow in the back part of the nostrils, and are generally due to catarrhal conditions. They block the nose passages, producing snoring and difficult breathing. The treatment consists in scraping them away with a scoop, or even with the finger, to the great relief of the patient.

WARTS ON THE NOSE.

Treatment.—Warts in this locality are often mistaken by the laity for cancer and afford the charlatan and the advertising doctor an opportunity to make "cures" of this greatly feared disease. Warts in this locality are treated just as in other parts of the body.

CURATIVE MEDICINE.

PART V.

DISEASES OF THE CIRCULATORY AND ABSORBENT SYSTEMS.

New Medical Views.—Affections of this class were, until recently, supposed to present symptoms of very much the same general character, and therefore to constitute a class of maladies which possessed considerable unity in their intrinsic nature. They are now, however, found to consist of a variety of distinct affections producing very different and sometimes opposite symptoms. Thus hypertrophy produces increased and dilatation diminished force of the circulation. In order, therefore, to appreciate the value and familiarize ourselves with the nature of each class of symptoms, it is necessary to study the several affections in an isolated form. We are thus enabled, on meeting with a compound case—one consisting of a complication of several of the simple affections—to analyze or unravel the symptoms, ascertain the relative importance of each class, and in this manner establish rational and secure principles of treatment. In conformity with this view, the various articles on the diseases of the circulatory and absorbent systems, instead of being assembled under the present head, are, for facility of reference, diffused alphabetically throughout the work.

ACTION OF THE HEART.

Hearing the Heart-Beats.—If we apply the ear, with or without the stethoscope, to the cardiac region of a person in health, we perceive most distinctly a series of sounds of a very marked and peculiar kind, subdivided into uniform parts by a brief interval of silence after every second sound. Two sounds follow each other instantly, or within so short a space that the ear separates them rather by difference in their quality than from the intervention of any notable cessation of sound; then ensues a brief but well-marked pause, which is again succeeded by the first of the time sounds. This series of sounds may be perfectly well represented, as to rhythm, by musical notation. The relative duration of the sounds and pause is represented by Lawrence to be nearly as follows: the whole being divided into four parts, two of these are occupied by the first sound, and one by the second sound and the pause respectively.

Difference in the Sounds.—The two sounds differ in kind as well as in duration. The first is nearly double the length of the second, of a graver and more subdued tone, rather louder at its commencement than at its termination, as if it was about to die away, when suddenly interrupted by the second. The second is brief, smart and clear, like a gentle tap with the pulp of the finger on a solid table, or like the sharp sound produced by the pulling back of a valve, the cracking of a whip, or the lapping of a dog. Exactly synchronous with the first sound, there is perceptible, in most cases, a well-marked impulse or shock communicated evidently by a body in motion within, in the walls of the chest. Every one acquainted with anatomy and physiology will at once conclude that the sounds and impulse just described are produced by the motions of the heart; and this conclusion will be justified and confirmed by an examination of the pulse in the extremities. It will be found, in all healthy subjects, that there is an invariable connection between the sounds and the pulse; every stroke of the latter corresponding very accurately with every repetition of the twin sounds; as, under every variation of circumstances as to loundness, frequency, and so forth, the same exact relation is perceived, it cannot be doubted that there exists an essential physical connection between the causes of the sounds and the pulse.

Rhythm of the Heart.—The first motion of the heart which interrupts the interval of repose is the auricular systole. It is a very slight and brief contractile movement, more considerable in the auricular appendix than elsewhere, and propagated with a rapid vermicular motion toward the ventricle, in the systole of which it terminates rather by continuity of action than by the succession of a new movement. The ventricular systole commences suddenly and is accompanied with a considerable diminution of the volume of the organ. Synchronous with the systole are the first sounds—the impulse of the apex against the ribs and the pulse in vessels near the heart; in the radials the pulse follows at a barely appreciable interval.

The Diastole Motion.—The systole of the ventricles is followed by their diastole, during which they return, by an instantaneous expansive movement, sensible to the touch and sight, to the same state (with respect to size, shape, position, and so forth), as during the previous interval of repose. This movement, or diastole, is accompanied by the second sound, by an influx of blood from the auricle, by a retractile motion of this cavity most observable at its sinus, and by a retrocession of the apex of the heart from the walls of the chest. Next succeeds the interval of repose, during which the ventricles remain at rest, in a state of fullness, though not of distension, through the whole period intervening between the second and the first sounds; but the auricle remains at rest during the first portion only of the period, the remainder being occupied by its next contraction, with which recommences the series of actions described.

1. The ventricular systole occupies half the time of a whole beat.

2. The ventricular diastole occupies one-fourth or one-third.

3. The interval of ventricular repose occupies one-fourth, or rather less, during the latter half of which the auricular systole takes place.

Causes of the Motions.—The auricles, which are always in a state of fullness, arrive, during the first half of the period of ventricular repose, at the state of distension, by which they are stimulated to contract. The object of the contraction at this movement is to propel a small additional quantity of blood into the ventricles for the purpose of bringing them from the state of fullness to that of distension; an object which could not be accomplished without a contraction, as the blood could not otherwise force its way into the ventricles against the resistance offered by their elasticity. The cavities, then, being brought to the state of distension, are by this stimulated to contract; they expel a greater or less proportion of their contents; in small animals—frogs, for instance—they expel the whole; which is proved by the ventricle being full. In larger animals they no not appear to expel the whole, but the fact does not admit of demonstration. During the act of expulsion, the apex is tilted up, in consequence of the retraction of the ventricles toward the base and upon the auricles, which, in a state of extreme distension, are placed like a fulcrum beneath them.

Causes of Diastole Motion.—The diastole appears to be occasioned by several concurrent causes, viz.:

1. That power of the muscle by which it reverts from the state of contraction to that of relaxation, and in virtue of which it exercises a degree of motion. It may be called elasticity.

2. The distension of the auricles, which is greater at this moment than at any other, as they have been filling during a longer period; namely—that of the ventricular contraction, or half a whole beat.

3. The weight of the ventricles collapsing on the distended auricles underneath them.

THE HEART.

FIGURE No. 1.

1. External or muscular tunic of the upper right cavity of the heart (right auricle).
2. External or muscular tunic of the left upper cavity (left auricle).
3. External or muscular tunic of the right lower cavity (right ventricle).
4. External or muscular tunic of the left lower cavity (left ventricle).
5. Upper cava vein, or conduit which carries the blood from the upper part of the body to the heart.
6. Under cava vein, or conduit from the lower part of the body.
7. Pulmonary artery.
8. Aorta.

9, 10. Coronary arteries.

11. Division seat between the right and left ventricles.
12. Series of vessels for feeding the external part of the heart.
13. Position of the valves of the heart.

FIGURE No. 2.

1. Back part of the right auricle.
2. Back part of the left auricle.
3. Back part of the right ventricle.
4. Back part of the left ventricle.
5. Opening of the upper cava vein.
6. Aorta.
7. Pulmonary artery.
8. Lower cava vein.
9. Vessel for feeding the walls of the heart.
10. The same.
11. Position of the valves of the heart.

FIGURE No. 3.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Parts and vessels of the heart as demonstrated in Figures Nos. 1 and 2.

11. Windpipe (larynx).
12. Cartilages and seat of the vocal cords.

13, 14. The lungs in their upper part, called the apex.

15. Branches, in the lungs, of the greater blood-vessels.

16, 16. Base of the lungs, showing the exterior surface.

FIGURE No. 4.

1. Cavity of the auricle.
2. Cavity of the ventricle.

3,3,3,3. Muscular tunics.

4. Tricuspidal valve.
5. Pulmonary artery.

6,6,6. Inner tunic of the heart.

7. Mitral valves.
8. Auricula-ventricular opening.
9. Dividing wall.
10. Aorta.
11. Cava vein.

FIGURE No. 5.

1,2,3. Pericardium.

4. Muscles of the wall of the heart.
5. Plaits of the lining of the heart.
6. Tendon cords.
7. Fleshy columns.
8. Seat of the valves.
9. Opening facing the auricle.
10. Walls surrounding the mitral valve.
11. Mitral valve.
12. Semilunar valves.

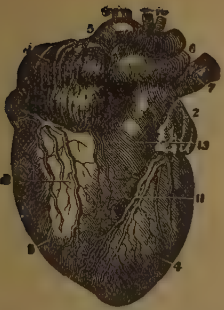


Fig. 1.—Front vertical view of the heart with its injected veins.

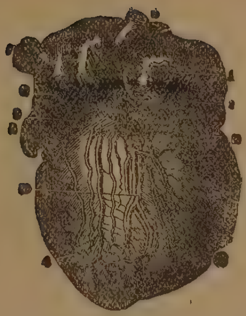


Fig. 2.—Back vertical view of the heart with its injected veins.

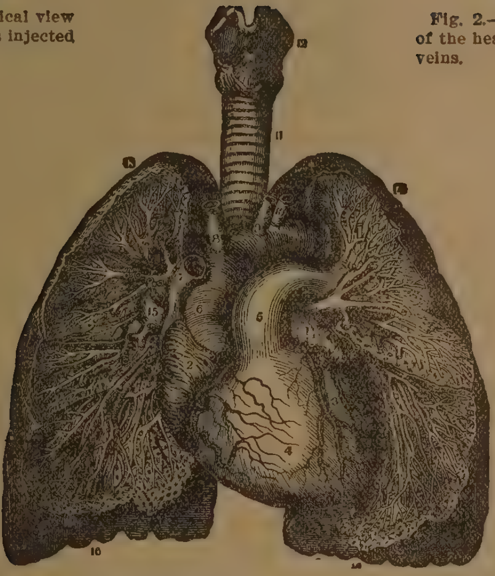


Fig. 3.—View of the bronchia and veins of the lungs, exposed by dissection, as well as the relative position of the lungs to the heart.

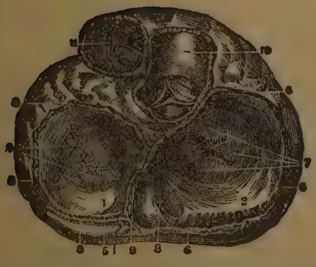


Fig. 4.—Vertical view of the auriculaventricular and arterial valves of the heart.

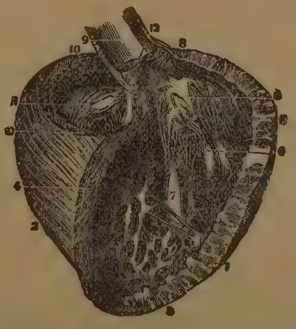


Fig. 5.—Three-quarters view of the left ventricle after removing front walls.

THE HEART.

For an explanation of the illustrations see text on opposite page.

4. The width of the auricula-ventricular orifice, which allows the blood to shoot in instantaneously and with great facility.

It is obvious that, as so many powerful causes conspire to promote the influx of the blood, an auricular contraction for this purpose would be superfluous. The escape of blood from the auricles during the diastole causes the slight retraction observable in them at the same moment. The expelled blood being instantly replaced from the vena cava, distension of the auricles recommences, and the same series of actions is renewed.

Causes of the Sounds.—The ventricular systole is the cause of the first sound, by the impulse which it communicates to the blood within it, thereby exciting sonorous vibrations of the fluid. If the sound of the muscular contraction contributes at all to the first sound it can only be in a very slight degree. The ventricular diastole is the cause of the second sound, by the reaction of the walls on the blood, and the consequent production of sonorous vibrations, when its cause is abruptly arrested by the completion of the diastole. Hence this sound is loud, brief and clear. The auricles are not concerned in the production of the two sounds, as they take place when these cavities are motionless; nor do they appear to be productive of any sound, as no third sound is audible.

Auscultation or Sounding.—We now proceed to examine more minutely the phenomena produced by the actions of the heart, in health and disease, with the view to deduce therefrom such diagnostic signs as they are capable of affording. It is hardly necessary to premise that the auscultatory diagnostics of cardiac diseases are founded precisely on the same principles as those which apply to diseases of the lungs.

GENERAL SYMPTOMS OF HEART DISEASE.

Physical Signs.—Disturbance of the functions of the heart must necessarily produce decided effects throughout the whole circulatory apparatus. Appreciable modifications of the arterial pulse of the state of the veins and capillaries show that the circulation is embarrassed. The pulse irregular, unequal and intermittent, as are the pulsations of the heart very small; but when there is considerable hypertrophy of the left ventricle, the pulse is also hard and vibrating, presenting sometimes a peculiar fremitus, which is most distinct in the carotid, subclavian and radial arteries. In some cases the arterial pulsations succeed one another, stroke by stroke, and this reduplication of the pulse is coincident with a regurgitant murmur heard on auscultating the heart. The insufficiency of the aortic valves is characterized by a bellows-murmur at the base, accompanying the second sound of the heart, and by a bounding pulse with flexuosity of the radial artery.

Symptoms.—When disease of the heart has reached a pretty advanced stage, the existing impediment to the venous circulation is indicated by swelling of the veins near the heart; those, for example, of the neck and face; and this turgescence is particularly obvious in the external jugular veins, where it is sometimes accompanied by undulatory pulsations, analogous to and synchronous with the arterial pulse. This is the venous pulse indicative of hypertrophy of the right ventricle.

Further Symptoms.—In addition to the embarrassment of the venous, there is embarrassment of the capillary circulation, which declares itself by a livid tint of the skin, swelling of the face, puffiness of the eyelids, a bluish color of the lips, and more or less injection of the skin of the extremities.

Palpitation.—As palpitation is under all circumstances dependent on over-excitement of the nerves of the heart, the phenomenon is always essentially the same. The varieties which it presents arise merely from differences in the causes and from the different routes which these causes pursue in order to arrive at and convey their stimulus to the heart.

Blue Skin.—Cyanosis is a morbid appearance which consists in the skin assuming a blue, purple or violet color, especially in those parts where the cutaneous capillary vessels are superficial, as on the cheeks and lips. It is generally accompanied by difficult respiration, palpitation of the heart with diminution of the natural temperature, an irregular or intermitting pulse, and is often attended with dropsical symptoms, the face especially, in addition to the purple color, being bloated and edematous; all these symptoms are much aggravated by any exertion.

PERICARDITIS.

Intensity of the Disease.—Its intensity varies considerably in different cases, being sometimes excruciating and sometimes slight or even wanting. There is also more or less tenderness on pressure over the region of the heart, and its action is notably increased. With these local symptoms are associated those pertaining to the system at large which accompany symptomatic fever. As the affection is almost always developed in connection with other diseases, the symptoms of the latter are of course combined with those of the former.

Diagnosis.—The diagnosis or recognition of pericarditis has been rendered prompt and positive by means of auscultation and percussion. Soon after the attack the exudation of fibrine occasions a friction sound with the heart's movements, and this is proof of the existence of the disease. Afterward, when considerable liquid has been effused into the sac, the friction sound may cease, but it is practicable to determine the presence and the quantity of liquid within the sac by physical signs, which are obtained only by auscultation and percussion. The danger in cases of pericarditis depends, other things being equal, on the intensity of the inflammation, the quantity of exuded fibrine and the amount of effused fluid. Aside from these conditions, much depends on the diseases with which it is associated.

Symptoms.—When developed in connection with rheumatism, it ends in recovery in the majority of cases; but occurring in connection with diseases of the kidneys, with pleurisy or pneumonia, and in cases of pyemia, it ends in death much oftener than in recovery. When death is not sudden, the disease destroys life by slow asthenia or exhaustion.

As a rule from the outset we have acute inflammatory fever, a pungent, burning, lancinating pain in the region of the heart, shooting to the left scapula, shoulder, and upper arm, but rarely descending below the elbow, or even quite to it. The pain is increased by full inspiration, by stretching the left side, and especially by pressure between the precardial ribs, and by forcing the epigastrium upward underneath the left hypochondrium. When the inflammation is only subacute the pain is more or less dull, and does not lancinate. There is inability of lying on the left side, and sometimes in any position but one, which is most commonly on the back, dry cough, hurried respiration, palpitation of the heart, the impulse of which is sometimes violent, bounding and regular, though its beats may at the same time be unequal in strength, at other times it is feeble, fluttering and irregular, pulse always frequent, and generally, at the outset, full, hard, jerking, and often with a thrill.

Causes.—The most frequent causes are blows or excessive pressure in the pericardial region, inflammation propagated from the lungs or pleura, and far above all, rheumatism. From this cause children and young persons suffer much oftener than others. The remaining causes are those of inflammation in general, viz., cold, febrile excitement, and so forth.

Treatment.—As regards treatment, acute pericarditis claims in general the measures indicated in other inflammatory affections. The antiphlogistic treatment, in as energetic a form as circumstances will allow, should be employed with the utmost promptitude. The loss of a few hours at first may be irretrievable, and hence hesitation and indecision may seal the fate of the patient. These measures, however, are in many cases to be modified by the circumstances pertaining to the diseases with which this is associated.

Strength of the Remedies.—The strength of the remedies employed must in each case be apportioned to the vigor of the patient's constitution; but the object is the same in all, expeditiously to prostrate the action of the heart, and for a time to keep it prostrate by preventing the reëstablishment of reaction. If this object can be accomplished for the first twenty, thirty or forty hours, the disease frequently does not rally, but remains perfectly under the control of remedies.

Additional Treatment.—In addition to the above measures diluent cooling drinks—as four scruples of bitartrate, or two of nitrate of potassa in a quart of water, and flavored at pleasure—should be allowed in unlimited quantity, in order by diluting the blood to render it less stimulant to the heart. Nauseating doses of tartrate of antimony, as one-sixth to one-eighth of a grain every two hours, may be employed with advantage. Colchicum often proves useful, especially so when the disease is of rheumatic origin. Calomel, trusted still by some and abused by others, may be confined to open sthenic cases in previously good constitutions. Where the rheumatic diathesis is marked alkalies will be indicated. Carbonate or bicarbonate of potassium, or bicarbonate of sodium, may be given in scruple or half scruple doses, with as much of rochelle salts, three or four times a day.

Continued Treatment.—Should pain continue in the advanced stages of the disease, blisters may be resorted to, and repeated in quick succession, with great advantage. For the stage of effusion we have occasionally found a third or a fourth necessary, combined with the use of diuretics, as squills, juniper, sps. arth. nit., and so forth, varied and continued until absorption occurs. Tonics will often promote the same end.

Convalescence.—An individual who has recently been affected with pericarditis is peculiarly liable to a recurrence of it, especially if it has resulted from rheumatism, and if the reparation has been incomplete. In this case, should rheumatism return, it rarely fails to be accompanied with a renovation of the pericarditic symptoms.

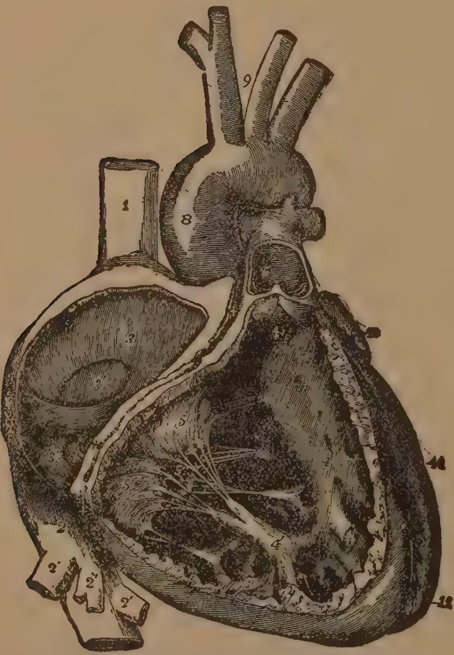
Diet.—A very spare unstimulating diet and extreme tranquillity must be imperatively enjoined until the action of the heart has become perfectly and permanently natural. This should consist wholly of the weakest slops, as barley, water gruel, weak tea, arrow root, and so forth.

Chronic Peculiarities.—Chronic pericarditis may be a sequel of the acute affection, or the inflammation may be subacute from the first. In some cases the inflammation continues with an abundant exudation of lymph, agglutinating the inner surfaces of the sac, and proving fatal by slow exhaustion. In other cases a large accumulation of liquid takes place, amounting to several pounds in weight, and to the exhaustion incident to the persistence of the inflammation is added the compression of the heart thus occasioned. In both varieties the disease, as a rule, proves fatal sooner or later.

Treatment of Chronic Pericarditis.—A rapidly depressing case of pericarditis, with cold, blue skin and feeble, irregular pulse, will require, instead of the above, a supporting or stimulating treatment from the first; with dry cups and blisters instead of local or general bleeding; and quinine, ammonia and whiskey, instead of sudorifics or laxatives.

ENDOCARDITIS.

Signs of the Disease.—Inflammation of the internal membrane of the heart. In this affection the inflamed membrane is in contact with the blood contained within the cavities of the heart; hence, although fibrinous exudation takes place as in pericarditis, the exuded lymph is in a great measure washed away from the membrane and carried into the circulation. A portion, however, adheres to the membrane roughening the surface in contact with the blood, and giving rise to an abnormal sound (an endocardial or bellows murmur), which is an important physical sign of the disease. Moreover, upon the little masses of lymph which adhere to the membrane, coagulated fibrine from the blood contained in the cavities of the heart is apt to be deposited, and in this way are produced the so-called vegetations or warty growths, which being sometimes detached and carried into the arteries with the current of the blood, are



Cavities of Right Side of Heart, with their Valves.

arrested in vessels too small to allow of their further progress, become fixed and occasion an obstruction which may lead to hemorrhage (hemorrhagic infarctions), and to the impairment of nutrition within a circumscribed area beyond the point at which the obstruction is seated. These movable plugs or emboli, as they are termed, play an important part in affections proceeding from disturbance of the circulation and nutrition in different organs of the body, more especially the brain.

Local Effects.—The local effects of endocarditis are also of much importance as laying the foundation for progressive changes, especially in the valves of the heart, constituting what are called valvular lesions. The inflammation in endocarditis is generally limited to the left side of the heart; that is, to the endocardial membrane lining the left ventricle and the left auricle.

Causes.—Like pericarditis, this is very rarely a primary disease, and in the great majority of cases it occurs in connection with acute articular rheumatism. It is evidently due to the same internal agency which in rheumatism causes the inflammation within the joints; this agent being a morbid principle in the blood, is supposed to be lactic acid.

Diagnosis.—Its development is attended with little or no pain or other subjective symptoms referable to the heart; the diagnosis rests wholly upon physical evidence attained by auscultation. The roughening of the endocardial membrane within the left ventricle causes, as already stated, an adventitious sound or murmur, and the production of this murmur, while a patient is under observation, constitutes the proof of the presence of the affection.

Symptoms.—The symptoms produced are blueness and coldness of the skin, the result of the disease affecting the valves of the heart so as to render them more or less incompetent to perform their functions, and diminishing the size of the mitral or aortic orifice so as to produce more or less obstruction to the passage of blood. Obstruction of the flow of blood through the orifices within the heart, and regurgitation, lead to enlargement of the organ and to various morbid effects in other organs; indistinctness of the heart sound, feebleness and irregularity of the pulse, nausea and vomiting, anxiety of expression and fainting.

Treatment.—In every case the important question is, less the state of the particular valves than the amount of interference with the functional action of the heart. In young persons remarkable recoveries sometimes take place. In other instances, adaptation of the heart itself, and of the general system by degrees, is effected, so that quite good health, and even capacity for exercise, may be attained, while the physical signs of the local organic change remain. Sudden death is less common in heart disease than is popularly supposed.

The Circulation.—The circulation should be kept as tranquil as possible by a quiet life and a moderate unstimulating diet. The food, however, should be rather nutritious, comprising a little animal food or soup twice a day, in order to keep the muscular system in general, and that of the heart in particular, in tone. The same may be promoted by a clear, bracing, dry air. The general health and strength may likewise be improved by the occasional exhibition of bitters, mineral acid and chalybeates, with aromatics. The stomach, in particular, should be kept in good order, as its derangements, even a little flatulence or acidity, have a surprising effect in disturbing the action of the heart. The same may be said of the biliary secretion, when there is an unequal distribution of venous power, indicated by hysterical symptoms, and so forth, antispasmodics will be found useful.

Value of a Bath.—Attacks of dyspnœa are best relieved by immersing all the extremities in warm water, a blanket being thrown round the patient to promote perspiration, and fresh cool air being admitted to satisfy the craving for breath. While this is being done he should take an antispasmodic draught, composed of either laudanum, camphor, ammonia, and assafetida, combined according to circumstances. It may be repeated, two or three times, at intervals of from half an hour to an hour, according to circumstances.

Diet.—For the avoidance of attacks the more important of the measures of management relate to a proper regulation of the habits of life as regards diet, exercise, and so forth. While excessive muscular exercise is to be avoided, such an amount as is taken, without discomfort, may be highly useful by improving the general condition of the system; while excesses in eating and drinking are hurtful, a deficient alimentation is not less so. In brief, the great end of treatment is to render the system tolerant of the lesions as much and as long as possible, and this end is promoted by such a course of management, hygienic and medicinal, as conduces to the general welfare of the economy.

ADDISON'S DISEASE.

Nature.—Certain forms of general anemia which are neither attributable to excessive antecedent hemorrhages, nor to profuse or long continued intestinal fluxes, and which cannot by symptoms be connected with any diathesic state or marsh miasmatic influences, forms of general anemia, in fact, which appear to supervene under the influence of non-recognizable causes, in which besides the debility and languor of the patient, are characterized by a bronzed hue of the integuments, and which is most strikingly apparent on the skin of the hands, penis, groin, scrotum and axilla.

It has been termed by Addison the bronzed disease.

Symptoms.—The malady begins slowly, and its existence is not at first perceived. The patient has difficulty in fixing with precision the date at which he experienced its earliest symptoms. Its first manifestations are general discomfort, an enfeebling of the physical and moral faculties, and a state of real languor. The arterial pulsations are small and feeble, the pulse full, soft and easily compressed. The appetite is capricious, the patient showing repugnance to animal food, or a diminished appetite. At first digestion proceeds in a normal manner, at a later stage this function is disturbed by intractable vomiting. This symptom is accompanied by pain, or at least by a painful sensation in the epigastric region. The patient wastes away, and yet the most minute examination fails to discover any sign of organic change sufficient to account for the great disturbance of health and extreme anemia which exist. Finally there is a state of extreme debility.

Treatment.—In the treatment, having no specific remedy, we are obliged to direct our measures against the symptoms of anemia; ferruginous medicines, preparations of cinchona, and a tonic regimen are indicated. Decided advantage has followed the use of a combination of glycerine, in two-drachm doses, with fifteen or twenty minims each of chloroform and tincture of chloride of iron.

OBSTRUCTION OR OCCLUSION OF THE ARTERIES.

EMBOLISM.

Symptoms.—When the right half of the heart has received an embolus and the pulmonary artery is obstructed, collapse of the lungs, partial or entire, follows. Pleurisy, hemorrhage or bronchitis may also occur, or the symptoms may be great anxiety and dyspnœa, with reduction of the temperature of the body; a systolic murmur may be heard on auscultation; the rhythm of the heart becomes irregular, and pulsation of the jugular veins may be noticed. Giddiness may be present, with blueness and edema of the hands, feet, or both. Where emboli have become broken up and decomposed, septicemia results, commonly known as pyemia.

THE ARTERIES.

Figure No. 1.—Arteries of the palm of the hand and front of forearm

3. Deep part of the raised pronator of the radius.
4. Long supinator muscle.
5. Long flexor of the thumb.
6. Square pronator.
7. Deep flexor of the fingers.
8. Cubital flexor of the wrist.
9. Annular ligament, with the tendons that pass under the centre of the palm of the hand; the member is on the tendon of the long palmary muscle divided near its insertion.
10 The brachial artery.
12. Radial artery.
13. Recurring radial artery joining the end of the upper deep one.
14. Superficial veins.
15. Cubital artery.
16. Superficial palmary arch from which spring digital branches to three and one-half fingers.
17. Magna artery of the thumb and radial artery of the index.
18. Back cubital recurring artery.
19. Front interosseous artery.
20. Back interosseous artery passing through the interosseous membrane.

Figure No. 2.

1. Primitive carotid artery dividing itself into carotid external and carotid internal.
3. Occipital branch to the back part of the skull.
4. Upper hyoides artery.
5. Lower pharyngeal artery.
6. Masseter artery.
7. Submental artery.
8. Lower coronary artery.
9. Upper coronary artery.
10. Deep branch.
11. Back cervical artery.
12. Continuation and fold of the occipital.
13. Descending branch for muscles of the neck.
14. Posterior auricular.
15, 15. Temporal artery.
16. Parietal branches.
17. Frontal branches.
19. Orbitary branches.
20. Subclavian artery.

Figure No. 3.

Thoracic aorta.

The three branches from left to right are the unnamed ones.

The primitive left carotid and the subclavian left one.

The small branch in the curve is the bronchial one.

Figure No. 4.

1. The liver.
2. The stomach.
3. Upper gut.
4. Pancreas.
6. Great mesenteric artery.
7. Gastric branch.
8. Spleen.
9. Pyloric branch.
10. Pancreatic branch.
11. Hepatic artery.
12. Duodinal branch.
13. Cystic artery.
14. Branches to the stomach.
15, 16. Spleenic arteries.
17. Gastro-epiploic artery.
18. Descending aorta.
19. Great mesenteric artery.

Figure No. 5.

1. Cheek arteries.
2. Cœliac axis.
3. Gastric artery.
4. Hepatic artery dividing itself into right and left branches.
5. Spleenic artery.
6. Supra-renal artery on right side.
7. Right renal artery, which is longer than the left.
8. Lumbar arteries.
9. Upper mesenteric artery.
10. The two spermatic arteries.
11. The lower mesenteric.
12. The middle sacras.
13. The common iliac.
14. Internal iliac of the right side.
15. External iliac.
16. Epigastric artery.
17. Circumflex iliac artery.
18. Femoral artery.

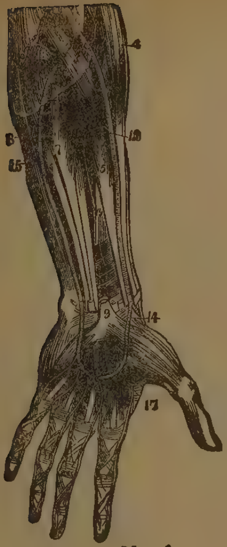
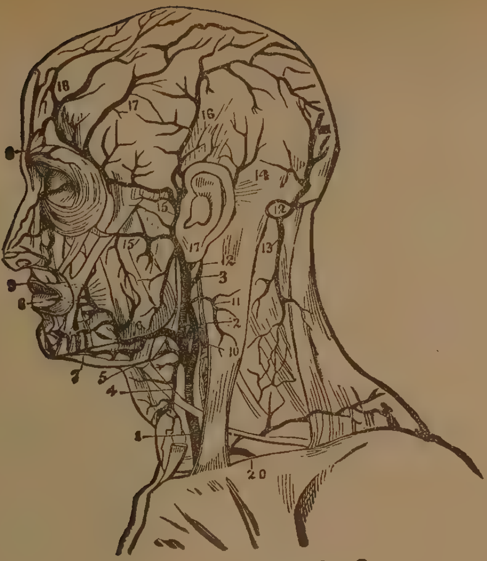


Figure No. 1.



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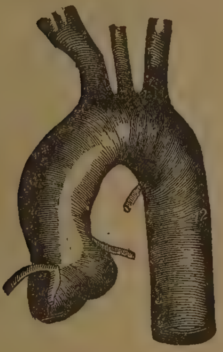

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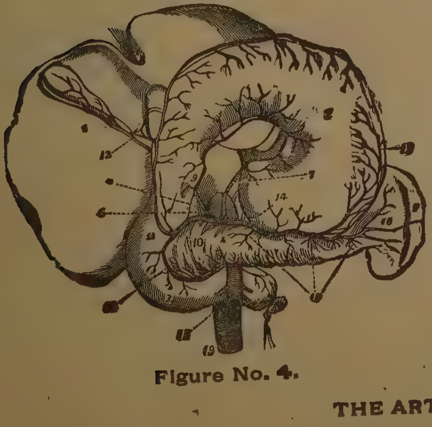

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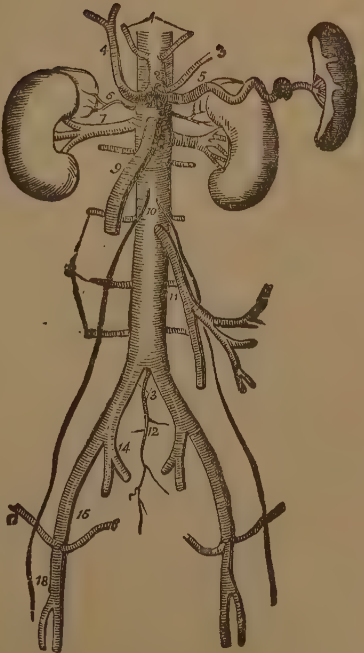


Figure No. 5.

THE ARTERIES.

For an explanation of the illustrations see text on opposite page.

Treatment.—The objects we should have in view in the treatment of a vessel occluded by an embolus are, to favor the venous circulation through the limb by its elevation, and to establish the arterial collateral circulation by maintaining the warmth of the limb by means of cotton carefully wrapped round it over oil lint. Pain can be relieved by sedatives, while the powers of the patient are to be maintained by nutritious diet, by stimulants carefully administered and by tonics. When gangrene has taken place the parts may be covered with some antiseptic material, as carbolic acid in a watery or oily solution, one part to thirty, or with powdered chloral. When the line of demarcation has formed and the gangrenous part can be removed by amputation, such an operation may be performed.

GOITRE.

Causes.—Though occasionally sporadic it is essentially an endemic disease in cold and damp countries, as in the deep valleys of the Alps, the Pyrenees, the Cordilleras in our own country, the chalky districts of Derbyshire in England, and so forth.

Symptoms.—A simple goitre appears to be a local affection, with only symptoms such as dyspnœa, or the cough as of a broken-winded horse on exertion, and even difficulty of breathing on the slightest cause. Whereas the exophthalmic form is part of a more general disease marked by the enlargement of the thyroid body, prominence of the eyeballs, palpitation of the heart, a peculiar thrill in the blood-vessels and a general want of muscular and brain power.

Treatment.—Simple goitres are to be treated on ordinary principles, viz., by attention to the general health, the inhalation of fresh air and by tonic medicines. Filtered or distilled water should always be taken, more particularly in districts where chalk, lime and magnesia abound. Iodine has always been held in high repute in this disease, in the form of iodide of potassium, and in four or five grain doses, given with bark or quinine, this drug is of use. For some years we have employed tonics alone by the mouth, and have ordered the air in the room to be kept iodized by means of solid iodine put into a box with a perforated lid; the metal thus evaporates steadily into the room where the patient sits and sleeps, and in this way it becomes absorbed. Under its influence we have often been surprised to find how rapidly goitres disappear. With this treatment we sometimes rub in an ointment of the iodide of ammonium, a drachm to an ounce.

ANEURISM OR BLOODY TUMOR.

Causes.—A low form of inflammation of the arterial walls is without doubt the most common predisposing cause, while over-action of the heart and circulation is the exciting one. Direct injury to an artery (traumatic) is an occasional cause.

Symptoms.—The early symptoms of aneurism are very uncertain. It often happens that the patient's attention is first directed to some swelling, although it may be only that of local throbbing, some weakness or stiffness of an extremity, or some nerve pain preceding the discovery of the disease; yet such symptoms are not constant. When, however, you are consulted for pain which shoots down the course of a nerve running in contact with a large artery, you should allow the thought of aneurismal pressure to pass through your mind, and, when this is associated with the presence of a tumor connected with the vessels, the suspicion of its being aneurismal should be excited. If this tumor be soft and pulsating, and becomes tense on the application of pressure to the trunk of the artery on the distal side, and placid, non-pulsatile and vanishing on pressure on the cardiac side, and should pressure on the tumor modify the pulse in the vessel below, the chances of its being aneurismal amount almost to a certainty. Should it expand again readily on the removal of pressure, this expansion is accompanied with a peculiar thrill on the readmission of blood into the sac, with a bellows murmur or aneurismal bruit, synchronous with the pulse.

Treatment.—The spontaneous cure of an aneurism is caused by the coagulation of the blood in the sac; how to induce this coagulation by natural processes is our aim; therefore, it is necessary to have a feeble circulation through it; for this purpose, rest in the recumbent position is an essential point of practice, and should be maintained in every case. When the force of the circulation is too strong and the powers of the patient are good, bleeding under these circumstances is not only rational but scientific. Medicines do not seem to have much influence in the coagulating process, though the acetate of lead has been found useful and iodide of potassium. The local treatment is based on similar principles, the aim being to diminish the circulation through the sac. This may be effected by the following means, viz., by compression in one of its forms of the artery above the aneurism, indirect; by compression of the aneurism itself, direct; by the Hunterian operation, viz., the application of a ligature to the artery on its cardiac side; by imitating the rare natural process of closure of the artery on its distal side by the application of a ligature, or by pressure, or by the artificial production of an embolic plug, by Fergusson's method of manipulation, and last of all it may be laid open and both ends tied. The treatment by electro-puncture, injection, and the introduction of some foreign body into the sac may be adopted in exceptional cases.

INFLAMMATION OF THE VEINS OR PHLEBITUS.

Symptoms.—The most prominent symptom of an obstructed vein is edema of the parts below the obstruction, some fullness of the superficial veins, local pain and tenderness; constitutional disturbance of variable degrees of severity generally preceding. When superficial veins are involved the symptoms may be chiefly local, but in the case of deep veins constitutional disturbance is certain to accompany local action. Among the superficial veins the saphena of the leg and thigh is most commonly affected, and is often a sequelæ of a varicose condition. Under these circumstances the tortuous, dilated, indurated vein becomes a marked object, set as it were in a frame of hardened inflamed skin and cellular tissue.

Treatment.—The two great indications for treatment in these cases are to favor venous circulation of the part, and to improve the general condition of the patient.

The first is attained by elevation of the limb, the foot being raised higher than the hip, and by the application of warmth. The second can be carried out by the administration of a simple nutritious diet, tonics, such as quinine, bark or iron, and stimulants carefully adjusted to the wants of the individual case.

Pain must be allayed by both local and general means, as poppy fomentations, and the internal use of sedatives. Leeching should never be resorted to, nor the use of mercury. When suppuration appears it must be dealt with on ordinary principles, but it is well, as a rule, to evacuate it as soon as it has declared itself.

INFLAMMATION OF THE LYMPHATIC VESSELS AND GLANDS.

Symptoms 1.—The absorbent glands with their ducts are liable to inflammation, adenitis or angeioleucitis, and this action is the result of the absorption of some septic material. It is almost always associated with a wound, punctured or open-inflamed suppurating, healing; with some point of irritation or suppuration, even a papule or pustule; with some centre from which morbific elements may be taken up. In what is called a simple wound the inflammation of the absorbents may be acute, but in poisoned it is violent and diffused. The inflammation always follows the course of the absorbents, leading from the centre of absorption toward the glands, that is, toward the body, and it never spreads backward. When it has reached the glands, the diseased action ceases to spread, that is, it expends its force upon the group of glands in which the absorbents naturally end, and does not extend through another series of absorbents to a second group. When pyemia follows or complicates the case, it may be open to question whether the poisonous fluid circulating in the lymphatics has not been allowed to pass into the blood through its usual channels, viz., through the inflamed glands onward, and set up inflammation in the tubes and glands, was taken directly into the blood through the venous channels, thus giving rise to blood-poisoning.

2. Pain and tenderness in some of the glands are generally early symptoms, and with these, or some following them, will be seen a band of redness varying in diameter, leading from the wound or infecting centre toward the gland. This red line may be continuous or interrupted; it may be a thin streak or a broad stripe of redness, and in some instances so radiate into the surrounding tissues as to simulate erysipelas. The whole line of redness is very painful, and with these local symptoms there will also be some febrile disturbance. The red lines follow the course of the absorbents and not of the veins.

Treatment.—When any indications of absorbent inflammation show themselves the wound or sore should be well cleansed and any collection of pus let out. The affected limb should be raised, the foot, when involved, brought higher than the hip; the hand or elbow than the shoulder, and warm poppy fomentations should be applied along the whole course of the lymphatics up to the group of glands in which they terminate. As soon as suppuration appears the abscess must be opened, whether this follows directly upon the inflammation or subsequently. A saline purge should be administered; sedatives should be given to allay pain. When suppuration has taken place tonics may be administered. In chronic cases, where induration in the track of the ducts remains, mercurial ointment and friction are sometimes valuable.

DISEASES OF THE DUCTLESS GLANDS.

The glands without any outlet in the body are three in number, namely: the thyroid, situated in the front of the neck; the spleen, located in the left side below the heart, and the supra-renal capsules, which are placed one over each kidney, deep in the loins on either side of the spinal column. Although the functions of these organs are still undetermined, many of their diseases are well known.

DISEASES OF THE SPLEEN (SPLENITIS).

Symptoms.—Diseases of the spleen may be acute or chronic. The acute symptoms are a sensation of cold and partial rigor, a feeling of weight, fullness and pain in the left side extending to the left shoulder, increased on pressure and coughing; thirst; some degree of nausea; dry cough with the usual symptoms of pyrexia. Wandering pains in the limbs, sometimes ending in collections of pus under the integuments of the thigh, arm, and so forth, are not uncommon in chronic splenitis. In the latter periods of the disease the debility and emaciation become very great; the complexion darkens and the appetite fails. Hectic, more or less violent, comes on with diarrhœa or vomiting of unconquerable pertinacity and blood is frequently discharged both upward and downward.

There is a simple enlargement of the spleen from mere temporary congestion, as when brought on by sudden mental emotion or by oscillations of the circulation from internal causes. In temperate climates the more permanent enlargement or hypertrophy of this organ, not being accompanied by the same violence of constitutional disease as in the latter, is usually of a passive character and is owing to relaxation of fibre. The most frequent causes of enlarged spleen are ague (ague cake) and remittent fever. The most characteristic symptoms are a sense of weight in the left side with or without evident swelling; inability to lie on the right side with ease; debility; disordered stomach; dry cough and absence of fever.

Treatment.—The indications of treatment are: first, to remove the cause; secondly, to restore the organ to its natural condition; and thirdly, to improve the general health. If ague be the exciting cause it must be combated by appropriate remedies, warm and brisk purgatives should be given once or twice a week so as to affect the upper bowels. Mercurials should be omitted. The bowels being kept more open than ordinary, the nascent irritative stage having gone by and the case being strictly passive, tonics are to be had recourse to and especially the acids with preparations of iron.

Leucocythemia.—Leucocythemia or white-cell blood is a disease of the circulating fluid often associated with enlargement of the spleen and supposed to be caused in part by the morbid condition of that organ. The great characteristic of this malady, as its name indicates, is the preponderance of white corpuscles in the blood.

Symptoms.—The general or constitutional symptoms are a slowly progressive anemia, weakness and emaciation, with incapacity for exertion, shortness of breath and digestive derangements. The bodily temperature is often somewhat raised and sometimes persistently elevated. The urine may be normal in appearance but less urea appears to be secreted in it. In the later stages there is a tendency to dropsy and to hemorrhage from various surfaces, especially the mucous membranes. The only certain mode of determining this remarkable disease is by a microscopic examination of the blood.

Treatment.—No specific for leucocythemia has yet been discovered. The constitution requires generous support, if not stimulation. Tincture of the chloride of iron in doses of ten or fifteen drops three times a day sometimes acts admirably.

DILATATION OF THE HEART.

Symptoms.—Dilatation of the heart is indicated, upon physical exploration, when, with extended impulse of the heart we have dullness on percussion beyond the usual limits. If true hyperthrophy or muscular thickening be present the impulse is very forcible as well as extended. The heart-sounds are apt to be clear, though not loud, in attenuated dilatation; rather loud, but dull-toned, in enlargement with thickening. It is most often induced by valvular obstruction or regurgitation, compelling unusual and continued efforts to sustain this circulation. Sometimes, however, it is more truly idiopathic, following causes of over-action of a heart otherwise sound, thus, violent exercise, self-abuse, coffee, tobacco, alcohol, and so forth, are, with good reason in predisposed cases, accused of producing it.

Treatment.—In the treatment avoidance of such exciting causes and particularly of violent exercise, alcohol and venery, is the main principle. Robust or plethoric patients may bear and be benefited by occasional leeching or cupping over the heart. Acetate of lead as an astringent cardiac sedative has proved useful in the dose of one grain thrice daily, with care to avoid saturnine poisoning. Digitalis here acts as a tonic to the heart, through ganglionic influences, lessening rapidity of action when that depends on debility, and veratrum viride as a sedative and palliative in violent acceleration of the pulse, as in muscular hypertrophy and in some forms of palpitation.

ENLARGEMENT OF THE HEART.

Symptoms.—Enlargement of the heart and its extent are easily determined by means of physical signs, palpation and percussion. By the touch it is found that the apex beat is more or less lowered and carried to the left of its normal situation. Between the apex and the base of the organ are found impulses not perceptible in health. By percussion the boundaries of the organ are readily ascertained in the great majority of cases. The vocal resonance also, as heard with the stethoscope, enables the physician to define the limits to which the organ extends. Palpation and auscultation furnish signs by which predominant hypertropy may be differentiated from dilatation. If hypertrophy predominates the impulses of the heart as felt by the hand are strong, and often there is a heaving movement extending over the region of the heart. The first sound of the heart, over the apex, is abnormally loud, long and booming. On the other hand, if dilatation be considerable or great, weakness of the organ is denoted by feeble impulses and by diminished intensity, together with shortness and a valvular quantity of the first sound of the heart in the situation of the apex.

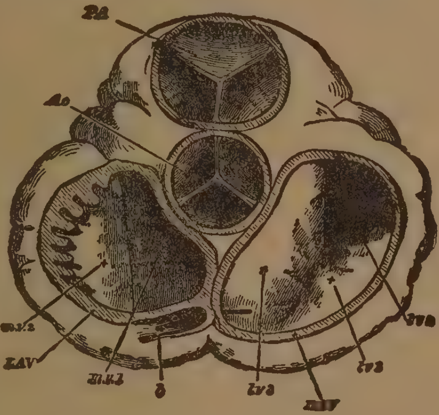
Treatment.—In addition to purgatives we have seen the most decided advantage result from diuretics, and not only when there was dropsy, but equally when there was none. Their mode of operation appears to be ultimately the same as that of purgatives, viz., they drain off the serous portion of the blood. We have found many patients, conscious of the benefit which they derived from this class of remedies, to be in the constant habit of taking cream of tartar, brown tea and other similar popular medicines. One patient, affected with contraction of the mitral valve to the size of an ordinary pea, by these means warded off dropsy beyond the slightest edema of the feet for ten years. When decided dropsy appears it must be combated by the most efficient diuretics, the acetate, or tartrate and nitrate of potash, squill, digitalis, spirit of nitre, ether, brome, and so forth, as no class of remedies is more variable and uncertain than this. When one fails another should be resorted to.

Diet.—The treatment consists of a highly nutritious diet, into which fatty articles should enter sparingly, together with the employment of hygienic measures and remedies designed to give tone to and to invigorate the heart.

CHRONIC VALVULAR DISEASE.

Diagnosis.—The diagnosis of valvular disease has been rendered very complete by means of auscultation. With very rare exceptions it gives rise to adventitious sounds or murmurs, the characters of which, as regards their situation, their transmission in different directions, and their relations to the heart sounds, enable the physician not only to determine their existence but to localize them and to distinguish between those which involve obstruction and regurgitation. When valvular disease has advanced sufficiently to produce obvious symptoms referable to either obstruction or regurgitation, or to both, they will destroy life sooner or later.

Whether the disease of the valves be cartilaginous, osseous, or consist of vegetations, the general symptoms are the same if the degree of contraction be equal. The general symptoms are cough, copious watery expectoration, dyspnœa, orthopnœa, frightful dreams and starting from sleep. Edema of the lungs, pulmonary apoplexy, passive hemoptysis (sputa stained with dark or grumous blood), turgescence of the jugular veins, lividity of the face, anasarca, injection of almost all the mucous membranes, passive hemorrhages, especially of the mucous membranes, engorgement of the liver, spleen, and so forth, and congestion of the brain with symptoms of oppression, sometimes amounting to apoplexy.



Bird's-Eye View of the Valves of the Heart.

The accompanying illustration represents a hardened section of the heart, cut transversely across the organ so as to show how the pocket-like valves come together in the middle of the openings in order to close those orifices. At LAV are seen the two flaps of the mitral valve, which shuts off the return current of the blood as it is being driven by the strong left ventricle into the aorta, and at Ao are depicted the three flaps of the aortic valve, which is closed by the return current of the blood from the great aorta after it is pumped into that large blood-vessel by the ventricular contraction. It is plain to be seen that if the edges of these valves are rough or ragged or perforated, they cannot shut tightly and will allow some leakage to occur.

Symptoms.—When the disease is combined with hypertrophy or dilatation, as is commonly the case, the symptoms are more severe than those of hypertrophy or of dilatation alone, the paroxysms of palpita tion and dyspnœa in particular being more violent, more obstinate and more easily excited. The action of the heart is irregular. The pulse is small, weak, intermittent, irregular and unequal.

Treatment.—Since we can neither replace or repair the damaged valves of the heart, the principles of treatment for chronic valvular disease are, in general terms, such as diminish the force and activity of the circulation, occasional venesection to a moderate extent, an unstimulating and rather spare, though sufficiently nutritious diet, a tranquil life, with respect both to the body and the mind, and a good state of the digestive organs and alimentary canal.

When there is dropsy diuretics are of the greatest utility. They are remarkably beneficial in an anterior stage of the disease; for, by drawing off the serous portion of the blood, they diminish the quantity without deteriorating the quality of the fluid, and thus relieve papitation and dyspnœa and obviate infiltration, without materially reducing the patient.

When diuretics do not remove dropsy and purgatives have failed, the practitioner is compelled to resort to puncturing. We say compelled, because the remedy is a last and dangerous resource. The danger, however, may be considerably diminished by making small punctures with a grooved needle, and allowing the fluid to ooze slowly during four or five days or a week. When incisions are made with a scalpel or lance, the fluid is evacuated quickly, as in twelve or forty hours, and the patient, according to our observation, generally dies.

FAINTING OR SYNCOPE.

Complete and, commonly, sudden loss of sensation and motion with considerable diminution or entire suspension of the pulsations of the heart and respiratory movements.

Symptoms.—It is to be distinguished from an epileptic or apoplectic fit by the fuller and apparent failure of the pulse and respiration, as well as by the previous history, if that can be obtained from friends or bystanders.

Treatment.—Syncope is, commonly, an affection of no consequence, but sometimes it is an index of diseased heart. Generally, recovery from a swoon is rapid if the patient is laid flat upon the ground, without any pillow, the clothing loosened from the neck and a little cold water sprinkled in the face and the application of volatile substances to the nostrils are all that will be required during the fit. If recovery is delayed a turpentine injection or one containing a little whiskey and water should be administered, and the electro-magnetic current may be transmitted through the walls of the chest to stimulate the failing powers of the lungs and heart.

PALPITATION.

Symptoms.—All excessive or consciously disturbed action of the heart is commonly thus designated. Over-action in particular may have either of the following origins: Nervous or hysterical, dyspeptic, rheumatic or gouty, hypertrophic.

All of the above forms of merely functional disturbance of the heart, and especially the purely nervous, may be known from hypertrophic overaction, or the conscious impulse of dilatation of the heart, by the fact that they are not increased by moderate exercise; are often, indeed, much diminished thereby.

Treatment.—The treatment must vary according to its cause. If nervous, invigoration of the system and enrichment of the blood are most probably required, by iron and other tonics and regimen. Dyspepsia will require appropriate treatment; as a part of which exercise in the open air will not be counter-indicated at all by sympathetic palpitation.

HEART PANG OR ANGINA PECTORIS.

Symptoms.—It is a disease of an intermitting character in which the patient has intervals of comparative ease or perfect health between paroxysms of greater or less suffering. It is characterized by sudden attacks of severe pain, extending from the heart along the left arm, with a sense of stricture in the chest, prostration and alarm. The pain is rarely confined to its primary and principal site in the cardiac region, but increases, in different instances, very variously both in direction and extent. It shoots upward or downward or to the right side and almost always through the left side of the chest toward the shoulder and axilla and very frequently into the left arm.

Treatment.—The violence of the patient's sufferings and the belief in the nervous or spasmodic nature of the pain, suggested by its sudden invasion, would naturally lead the medical attendant, in the first place, to attempt to afford relief by anodynes; such attempts, however, have generally been attended with less success than might have been expected. In angina, as in toothache or tic douleureux, gastralgia, colic, or other violent pains, nature seems as if she scorned to be controlled by art, although so much under the influence of similar applications when less needed, as in the case of milder pains. Antispasmodics, cordials, carminatives, and so forth, have been much recommended and employed; and, upon the whole, with better success than anodynes. The inhalation of one or two drops of nitrate of amyl sometimes relaxes the spasm and affords prompt relief. Small doses of nitro-glycerine and hypodermic injections of from one-eighth to one-half grain of morphia also partly relieve the pain after a little longer delay. But although these or other means may afford relief, or may even ward off death, it is evident that every kind of treatment confined to the paroxysm is of very slight importance. Compared with that which is to be employed in the interval, the former can, at most, afford temporary relief; the latter may cure the disease.

HEART ASTHMA.

Symptoms.—Asthma from disease of the heart often imitates the characters of the other varieties, and this perhaps for a very simple reason; that the lungs are in much the same state as in those varieties. Thus the asthma is humid or humeral when there is permanent engorgement of the lungs, causing copious sero-mucous effusion into the air passages, as in cases of contraction of the mitral valve. It is dry when the engorgement is only transitory, as in cases of pure hypertrophy. It is continued when there is a permanent obstruction to the circulation, and may be convulsive when the heart has sufficient power to palpitate violently.

Treatment.—Numberless remedies have been tried; among them stramonium, nitrate of amyl, chloroform inhalations, and so forth. Arsenic enjoys full favor and deservedly holds an important rank as a therapeutic agent

DISEASES OF THE ARTERIES.

The larger blood-vessels, both arteries and veins, are liable, like the heart itself, to various structural changes in disease, which, of course, lead to more or less serious disturbances in the circulation of the blood.

Symptoms.—Arteritis or inflammation of the substance of a blood-vessel, commonly commencing with the inner coat of the artery and extending through the whole structure of the wall of the tube, is a rare affection and scarcely ever detected before death.

Fatty and calcareous degenerations of the arteries are much more common, and consist in the deposit of fatty or chalky material in the arterial walls, generally in patches varying in size from a mere speck to an inch or more in diameter.

Treatment.—These diseases do not occur until after middle life and no satisfactory treatment has been found.

CURATIVE MEDICINE.

PART VI.

DISEASES OF THE BREATHING ORGANS.

ASTHMA.

Causes.—An exciting cause may be an impurity of the blood. More commonly it arises from indigestion, bronchitis or valvular disease of the heart. Hay asthma is caused by the inhalation of particles such as arise from dried hay. The pollen from flowers and also from dogs, cats and other animals frequently give rise to it.

Symptoms.—This disease comes on in paroxysms. The paroxysm may be preceded for a variable time by a sense of oppression and constriction about the chest, with wheezing respiration. In many instances, however, it develops without any warning and most commonly at night. The patient awakes suddenly, scarcely able to breathe, and is forced to assume the sitting posture, or even to stand erect, with the shoulders raised and fixed, the head thrown back, the mouth open and all the extraordinary muscles of respiration brought into play to assist those powers of the system which are usually sufficient for the purpose. The face, in severe cases, wears an aspect of terror, the eyes are widely opened, the skin is pale and dusky and often bedewed with sweat. The feet and hands are cold and the pulse small and quick. The breathing, however, is not hurried, but inspiration is short and jerky and expiration inordinately prolonged. On percussion, the resonance of the chest is found to be increased and auscultation shows the vesicular breath-sounds are weak or suppressed and attended with whistling or cooing noises called râles. Toward the end of an attack, which may last for several weeks, cough comes on with the expectoration of small, firm, solid pellets of mucus, in rare cases mixed with blood. The duration varies greatly, the paroxysm passing off in a few minutes or lasting for many days. When it continues long, or is left to itself, it is apt to subside gradually; but if brief or cut short by treatment, it often ends abruptly.

Diagnosis.—The diagnosis rests upon the paroxysmal and usually sudden nature of the onset, the absence of moist râles as determined by auscultation, and the complete recovery of patients in the intervals of their attacks. The cooing and whistling sounds heard all over the chest show the absence of any serious obstruction in the larynx and trachea, and the muscular effort being made for the purpose of inflating the lungs chiefly in asthma, from heart disease, instead of also in expiration as in the spasmodic form, which we are now considering, is another indication of value.

Treatment 1.—Among the most certain treatments are the inhalation of chloroform or ether and the hypodermic injection of an eighth or a quarter of a grain of morphia, either of which, in a majority of instances, may be depended on to relax the spasm and afford prompt relief.

2. Some of the most reliable internal remedies are chloral in fifteen-grain doses, which should be employed with great caution, or not at all if the heart is organically affected; ten or fifteen drops of tincture of lobelia or of ipecacuanha, as a nauseant or emetic, belladonna, valerian and strong black coffee.

3. The inhalation of the vapor of stramonium leaves, produced either by burning them on a red-hot shovel or smoking them in a pipe, and of the smoke of soft bibulous paper which has been soaked in strong saltpetre water and then dried, often affords relief, and, perhaps, as often fails in its desired object.

4. The treatment during the interval between the paroxyms must be directed toward building up the general health and fortifying the nervous system against the exciting causes of the disease. In some instances the action of small doses of lobelia is highly beneficial, and in others, patients who have been for years great sufferers from asthma enjoy a complete immunity from the malady as long as they keep themselves under the influence of iodide of potassium by taking from five to ten grains of it three times daily.

5. If medicinal treatment for the prevention of asthma proves unsuccessful, a change of climate and particularly a sea voyage should be undertaken, and it is claimed by some physicians in Colorado that the air of that region is almost a specific against asthmatic complaints.

HAY FEVER.

Symptoms.—Hay asthma or rose cold, commonly called hay fever, is a very prevalent form of asthma which comes on with symptoms of ordinary but severe cold in the head, constant sneezing, great discharge from the nose and in many cases intense difficulty of breathing. Many sufferers from this curious malady are perfectly well until a certain day in one of the months of June, July or August of every year, when they wake up in the morning, perhaps, with the symptoms above described.

Causes.—As already remarked, this form seems to be due to the inhalation of pollen from certain grasses or flowers, but when once commenced it may continue for several days, or even weeks, after its supposed cause has been removed.

Treatment.—The inhalation of sulphate of quinine in powder has been highly recommended in this affection, but the air (and other attractions) of various watering places seems to be the most popular and satisfactory remedy. The White Mountains or certain seaside resorts are looked upon by some patients as absolutely necessary for their health and comfort during an attack of this complaint.

Various Forms of Asthma.—Under the title of industrial asthma have been grouped several kinds of pulmonary disease, incident to different trades and occupations. These include saw-grinder's asthma, miner's asthma, potter's asthma and miller's asthma, caused by the mechanical irritation of minute particles of dust in the respired air, as already pointed out in Book III, Part II.

NOSE CATARRH.

Symptoms.—This disease, so well known to every one as a common "cold in the head," is often epidemic, and is characterized at first by chilliness with sneezing and later by an abundant discharge of fluid from the nose. When severe it is attended with slight fever, pain and sense of weight in the head, pain in the limbs, prostration of strength, irritability of temper and inactivity of mind.

Causes.—Its origin can generally be traced to some imprudent violation of the laws of hygiene, such as exposure to draughts, insufficient clothing, sudden cooling when heated, and so forth.

Treatment.—The number and diversity of the infallible remedies for a common cold is sufficient evidence of their generally unsatisfactory nature, but as the natural duration of the disease is from three to five days, the third or fourth medicine which receives twenty-four hours' trial often gains the credit of accomplishing a cure. If, as is usually the case, the bowels are constipated, a saline purgative, such as a Seidlitz powder or a bottle of citrate of magnesia, will usually relieve the headache, and then light diet, abstinence from fluids for a day and ten grains of Dover's powder at bed-time often seem to hasten the departure of this unwelcome guest.

LARYNGITIS OR INFLAMMATION OF THE LARYNX.

Three Forms.—This disease, which is one of the accompaniments of a common cold whenever hoarseness of the voice comes on, presents itself under three forms: First, the acute or edematous; second, the subacute or catarrhal, and third, chronic laryngitis. The first of these varieties may, if not properly treated, prove quickly fatal, by closing up the avenue of entrance for the air to the lungs and thus causing death by suffocation.

Symptoms of Acute Form.—Acute or dropsical laryngitis may commence as a slight catarrh, quickly followed by high fever. Speech, cough and respiration are all soon modified. The voice at first metallic, soon becomes whispering. The cough primarily clear and shrill, then harsh and croupy is also reduced to little more than a whisper, and a peculiar noise like a loud whisper accompanies both inspiration and expiration, which are, from the beginning almost, laborious and wheezing. As soon as the dropsical swelling comes on and still further narrows the opening of the glottis, the effort to breathe becomes exceedingly painful and difficult and the patient's countenance expresses great anxiety.

Treatment 1.—Since acute laryngitis in the adult may destroy life in a few days, or even hours, it should be treated actively from the first onset by bleeding, if the patient is robust, or by leeching, active purgation with five- or ten-grain doses of calomel and jalap and calomel in grain doses every two hours to the extent of producing slight salivation as rapidly as possible.

2. If the inflammatory swelling proceeds or if dropsy comes on and interferes with the respiration sufficiently to cause lividity or blueness of the lips, the operation of opening the windpipe should be at once performed. It is better to open the trachea or windpipe sooner than is absolutely necessary, than to postpone the operation until the blood has been rendered very impure by want of a proper supply of oxygen; yet even up to the last gasp and for, perhaps, a minute afterward, life may be saved by the surgical operation.

3. For children the danger to life from this malady is comparatively slight, so that bleeding and calomel may generally be dispensed with, and emetics, such as syrup of ipecacuanha or Coxe's hive syrup, in ten-drop

doses every three hours for a child of three years old, with the inhalation of warm opiate vapors, as, for example, that from the spout of a teapot, in which has been placed with a small quantity of boiling water fifteen or twenty drops of laudanum, are generally sufficient.

Subacute Form.—The subacute form of laryngitis rarely passes into the acute variety, and is, therefore, of but little importance. If severe, the same treatment by expectorants, nauseants and anodynes, recommended in acute laryngitis of children may be employed. Complete rest of the voice should be enjoined and inhalations of the various anodyne and astringent sprays are of great service in chronic cases.

Chronic Laryngitis Symptoms.—Chronic laryngitis is accompanied with actual thickening of the vocal cords, which, if the deposit be not subsequently absorbed, produces a permanent change in the voice. The respiration is usually but little affected, yet there may be a little tickling cough, an expectoration of small fragments of mucus and an almost constant desire to clear the throat.

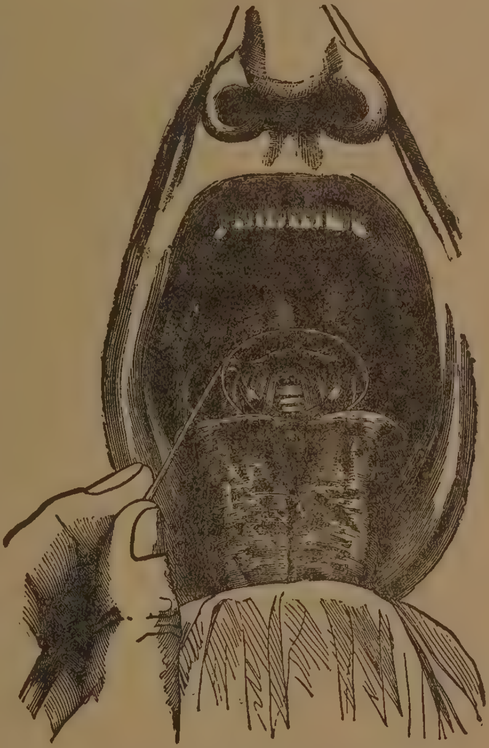


Image of Vocal Apparatus as Seen in the Laryngoscopic Mirror Held far Back in the Mouth.

Treatment.—Rest, by the avoidance of speaking above a whisper, a warm, moist atmosphere and medicated inhalations, are the important elements of treatment in this affection in its simple form.

The Laryngoscope.—By means of a small, metallic looking-glass, called a laryngoscope, a view of the epiglottis, the glottis itself, and, in favorable instances, the interior of the larynx, with some of the upper rings of the trachea, may be obtained. Such a view is given in the accompanying illustration.

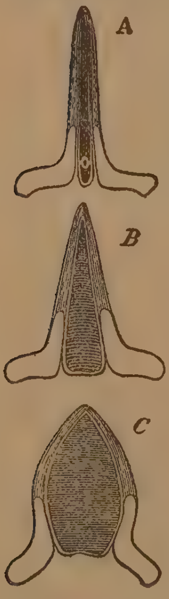
Treatment of Throat Ulcers.—When, by means of the laryngoscope, the existence and seat of an ulcer can be established, it should be touched with a strong solution of nitrate of silver, in the hope of thereby promoting a tendency to heal; or inhalations of astringent solutions, such as that of the sulphate of zinc, or of copper, and of carbolic acid, may be employed.

TRUE CROUP OR PSEUDO-MEMBRANOUS CROUP.

For a full description of the causes and treatment of this disease see Book IV, Part XII, DISEASES OF CHILDREN.

DISEASES OF THE VOCAL CORDS.

Tumors in Vocal Cords.—The development of new growths or little tumors within the cavity of the larynx is a cause of local obstruction to the breathing, which is happily rare. The three different kinds which have been met with are, first, the warty growths, having a firm structure, and attached to the inner surface of the laryngeal cavity by a broad base; second, polypoid growths, similar to those already mentioned as occurring in the nose, of a soft and jelly-like consistence attached to the mucous membrane by a pedicle or stem; and, third, cysts or hollow bags, containing, in some instances, parasites.

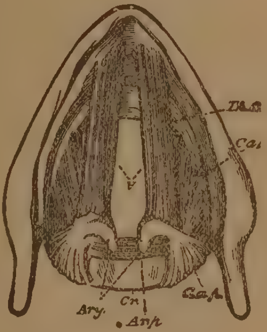


Changes of Position of the Vocal Cords.

Paralysis of Vocal Cords.—Paralysis of the vocal cords, resulting in aphonia or loss of the voice, is a very grave misfortune under certain circumstances, as, for example, to clergymen or lawyers.

Changes in Vocal Cords.—The changes in position which these vocal cords undergo in the different processes in which they are concerned, will probably be understood by reference to the accompanying diagram. At *A* is shown the appearance of the chink of the glottis, formed by the edges of the vocal cords, as it appears when examined by the laryngoscope whilst the patient is engaged in singing. *B* exhibits the condition in which it usually appears during easy and quiet respiration; and at *C* is represented the arrangement during forced inspiration or drawing a long breath.

Muscular Arrangement of Larnyx.—The figure in the margin illustrates the arrangement of the muscles of the larynx, as seen after the membrane and elastic tissue constituting the vocal cords has been removed. *Th* represents the large and firm thyroid cartilage; *Ary* the upper ends of the arytenoid cartilages, to which the posterior ends of the vocal cords are attached; *V* indicates the position of the vocal cords. At *Arp* is represented the band of muscle called the posterior arytenoid muscle, which has the duty of pulling the arytenoid cartilages together, and so narrowing the slit of the glottis between the vocal cords as to cause the production of just the right sound for any particular note in singing. The mechanism of hoarseness in the voice or cough is simply as may be understood with ease from this diagram, that the edges of the vocal cords becoming thickened by congestion or slight inflammatory action can no longer vibrate quickly enough to produce the higher notes of the voice.



Muscles of the Larynx.

Loss of Voice.—In paralysis of the muscles of the glottis, which, small as they are, the explanation given a few pages back shows to be very important, not only is the power to produce audible voice sounds lost, but breathing is rendered difficult, and great distress is produced by the inability to take a long breath. Aphonia, or loss of voice, is of two kinds, the simulated and the true. An imitation of the real disease is generally hysterical in its character, and though it may last for a long time, is never really permanent; it may sometimes be recognized by the aid of the laryngoscope.

Treatment.—True aphonia is due to actual palsy of these little laryngeal muscles, is generally dependent upon some serious injury or disease, and therefore in most instances incurable. The treatment of the pretended aphonia is that of hysteria. In bad cases chloroform may be given with advantage. During the intervals between the attacks, the bitter tonics, cod-liver oil and iron, and treatment for any uterine derangement, as described in the chapter on Diseases Peculiar to Women, should such disorder exist, are strongly indicated and will generally accomplish a cure in the course of time.

COMMON COUGH OR BRONCHIAL CATARRH.

Character.—This every-day disease is a subacute inflammation affecting the larynx, trachea, and larger bronchial tubes, sometimes commencing with nasal catarrh and traveling down, as it were, to the pulmonary organs. At other times, or in other patients, it appears to originate in the larynx, and does not affect the nasal passages at any time during its course.

Predisposing Causes.—The predisposing causes to this common affection are enumerated as being the loose flabby texture of tissue in certain individuals, especially those who are the subjects of the scrofulous diathesis, and rickety children; second, a previous attack, and third, effeminate modes of life.

Direct Causes.—The directly exciting causes are:

1. Chilling of a portion of the skin, and especially the change of temperature of a portion of the body produced by sitting in a draught of air whilst perspiring freely, or with damp clothing or wet shoes.

2. Irritants acting directly on the mucous membrane lining the air-passages, such as dust, acrid vapors, or hot and cold air, and the grinders, millers and stone-cutters.

3. Obstruction to the current of the blood through the great branches of the aorta below the origin of the bronchial arteries, such as may be caused by abdominal dropsy, accumulation of gas, or of refuse matter in the intestines.

4. As a result of morbid states of the blood, as seen when bronchial catarrh is a premonitory symptom of typhoid fever, measles and small-pox.

Symptoms.—The general symptoms of a common cold on the breast are so well known to every one that it is not worth while to occupy space in describing them, and yet, frequent as is popular acquaintance with this disease, few persons realize the terrible dangers which attend upon a neglected cough.

Treatment 1.—The most important thing in relation to this malady is to prevent its occurrence. This could probably be accomplished in four cases out of five by the exercise of a troublesome amount of prudence, which, however, would be well expended were young people willing to make the effort to escape this frequent cause of early death. When, however, a person is unfortunate enough to contract a cough by his own imprudence or otherwise, it may often be cut short by bringing on a free perspiration. A good way to accomplish this is to take a hot mustard foot-bath and ten grains of Dover's powder on retiring for the night, wrapping the throat up in flannel if it feels sore, and being very careful not to undo, and more than undo, the beneficial work of this treatment by uncovering oneself in the night, or by imprudent exposure the next day.

2. If this method is not resorted to early enough, or if it fails and the cough goes on unchecked, ten-drop doses four times a day of antimonial, or ipecacuanha wine, and nitrate of potash, or muriate of ammonia in quantities of five grains every three or four hours, are generally useful.

3. By the third or fourth day great advantage may be derived from the use of a mixture of half a teaspoonful each of syrup of squills and syrup of wild cherry with one-twelfth of a grain of acetate of morphia and the same quantity of cyanide of potassium every six hours. If this remedy agrees with the patient it may be taken more frequently or in sufficient doses to quiet the cough through the night, but it must be used with great caution, as it contains ingredients which are poisonous in over-doses.

4. Should the disease persist notwithstanding the employment of these various medicines, counter-irritation with croton oil and tincture of iodine applied to small spots on the upper part of the chest in front, or croton oil alone rubbed on the back, also with great caution, should be resorted to without that further delay during which the catarrhal irritation of the bronchial tubes might become chronic, as it is commonly phrased, and the cough get such a hold that it cannot be shaken off.

Auxiliary Treatment.—A very important part of the treatment is the breathing of a continuously warm, moist atmosphere, and for children especially, the prescription of one warm room is probably more conducive to recovery than any one of the medicines suggested. Particularly ought young children, in whom previous experience has shown there exists any tendency to croup, to be guarded against the development of that dangerous affection by even the slight additional exposure of passing through a cool entry to their meals. At the same time the apartment to which the invalid is confined must not be kept too warm, and due attention should be paid to its proper ventilation.

BRONCHITIS.

Character.—This disease, an inflammation of the bronchial tubes, or air-passages leading to the pulmonary vesicles, is characterized by hoarseness and moderate cough, with heat and soreness of the chest in front, all these being more or less intense according to the severity of the attack. In every common cough there is always some bronchitis, but the element of danger lies in the extension of the inflammatory action to the smaller bronchial tubes or bronchioles, and the approximation consequently to that fatal form of the malady termed capillary bronchitis.

Simple Bronchitis Symptoms.—Simple bronchitis is usually ushered in with a slight chilliness, general discomfort, and some febrile disturbance. A sense of constriction about the chest and some deep-seated soreness beneath the breast bone soon follow. The respiration is slightly increased in frequency, but no urgent dyspnœa is generally present, unless the patient is a sufferer from some chronic affection of the heart or lungs, as, for example, valvular disease of the former organ. Cough is uniformly present in bronchitis, is worse after sleep, and, as a rule, paroxysmal. The expectoration is at first scanty and viscid, but soon becomes more abundant, white and frothy, and still later yellowish or muco-purulent. In this latter stage the cough is looser, less painful, and the phlegm is expectorated more easily.

Capillary Bronchitis Symptoms.—Capillary bronchitis usually develops out of the simple form, and therefore its onset can hardly be said to be characterized by any well-marked symptoms. Occasionally, however, a sharp chill defines the date of its attack. When developed the patient breathes with difficulty, the complexion is dusky, and the countenance betrays anxiety. The superficial veins are over-filled, as a consequence of the obstruction to the pulmonic circulation, and the movements of the sides of the nostrils are exaggerated. The respiration and pulse are quickened, the former very much so, and out of proportion to the latter. The cough is almost constant, and the expectoration at first frothy, and after a time yellowish, is expelled with considerable difficulty. Troublesome pains in the intercostal muscles, brought on by the unremitting exertion of coughing, are of frequent occurrence, the temperature rises to a considerable elevation, and the restlessness is extreme; the renal excretion is scanty, and sometimes a little albuminous. In fatal cases the prostration becomes intense, the skin livid, cold and clammy. Dropsy of the feet and legs may come on, and at last fitful drowsiness or muttering delirium precede coma and death.

Acute Bronchitis Diagnosis.—The diagnosis of acute bronchitis is ordinarily not difficult. Capillary bronchitis must be distinguished from pneumonia, which can generally be done by the greater amount of fever and disturbance of the respiration as well as the dullness on percussion, tubular breathing, and irregular distribution over the chest of the latter affection. In acute tuberculosis, or galloping consumption, the violence and irregularity of the fever, the rapid collapse of strength, and the extreme dyspnœa, out of all proportion to the physicial signs, indicate the nature of the case in most instances.

Treatment 1.—A threatened attack of bronchitis may sometimes apparently be cut short by a hot foot-bath and dose of Dover's powder, as already suggested, and a full dose of ten grains of salicin or of quinine will perhaps aid the good work of this treatment.

2. After the disease is fully developed the remedies are chiefly palliative, and consist of opiates, such as morphia, belladonna, or preferably, in many cases codeia, in half-grain doses, to quiet the cough and promote the expectoration. The softening of the secretion, and easing of the incessant cough, are also promoted by keeping the patient in a moist atmosphere, as suggested in regard to croup.

3. Pain in the chest can often be relieved by mustard-plasters and stimulating liniments, or painting with tincture of iodine. Half teaspoonful doses of the syrups of squills, ipecacuanha and lobelia, every two, three or four hours, according to the urgency of the symptoms, are probably useful, and the iodide of potassium, in five-grain doses, if well borne by the patient without irritating the mucous membranes of the eyes and throat, as it sometimes does in a singular way, is highly recommended.

Diet.—There is no need of restricting the diet in this disease, and any wholesome food which the patient craves may be allowed. In the treatment of the capillary bronchitis of young children it is necessary to use opiates with much greater caution, and the occasional administration of an emetic, to aid in clearing out the accumulated mucus, is important. Counter-irritation by mustard or turpentine may be tried, and dry cupping often gives great relief.

Chronic Bronchitis.—Chronic bronchitis is a very common malady, its frequency increasing with the coming on of old age. It may be chronic from the outset, or be the result of the acute form. Chronic lung diseases generally are apt to lead to it, and so does the abuse of alcohol.

Treatment.—Chronic bronchitis, especially when in the form called dry catarrh, is often relieved by iodide of potassium and colchicum.

PNEUMONIA OR INFLAMMATION OF THE LUNGS.

Causes.—This disease, called also lung fever, is the most serious of the common acute diseases of the pulmonary organs. Long continued exposure to cold is apt to be the exciting cause of pneumonia; but there are some reasons for supposing that it is, at least in many instances, a local manifestation of a general disease, perhaps contagious in its character. It often comes on in the course of other grave maladies and adds very much to their fatality.

The Stages.—The three stages through which this complaint passes in typical cases, are, first, that of congestion, where the lung is engorged with blood; second, that of red-hepatization, in which the inflamed lung is dark-red and solid like a piece of liver, sinking in water and breaking down readily under the pressure of the finger; and, third, the stage of grey-hepatization, in which the affected pulmonary tissue is still dense, but of a yellowish-grey color.

Symptoms 1.—The symptoms of an ordinary attack of pneumonia, coming on from exposure to cold, in a robust adult, are quite characteristic. The disease usually sets in with a single severe and prolonged chill, after which the temperature of the body rapidly rises to a high point and this rise is accompanied by the customary symptoms of fever. Pain is commonly felt about the region of the nipple on the affected side and is sharp, stabbing and aggravated by movement in breathing or otherwise, and also by pressure.

2. There is, likewise, well-marked dyspnœa, characterized by extremely frequent, shallow breathing, quite different from the kind of dyspnœa observed in bronchitis and in asthma; the rapidity of respiration ranges from twice to four times the frequency of health, that is, from about thirty to sixty per minute; and this increase in the number of the respiratory efforts is partly due to fever, partly to impurity of the blood and partly to the pain which prevents drawing a full breath. The sides of the nostrils are commonly in active movement at every inspiration.

3. The third prominent symptom is cough, generally frequent, hacking and constrained on account of the suffering which it causes. It is dry at first, but on the second or third day the patient commences to bring up at each paroxysm of cough, some of the peculiar, viscid material of exactly the color of rusty iron. This expectoration does not occur in young children, is often absent in secondary pneumonia and in the pneumonia of the aged. The fever usually attains its height on the second or third day.

4. The pulse is usually strong and full at the outset, but later on in the attack it becomes small and weak, partly as a result of the imperfect filling of the arteries from obstruction of the pulmonary circulation and partly from cardiac feebleness. The cheeks are flushed to a very marked degree and an eruption of little blisters, a variety of herpes, is sometimes

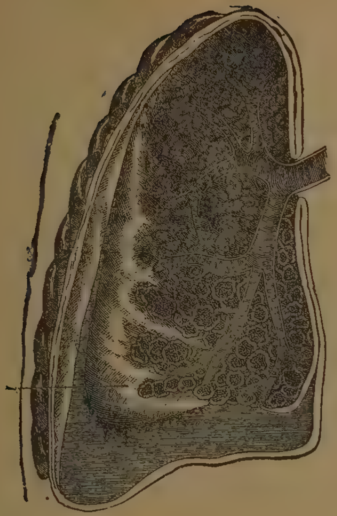
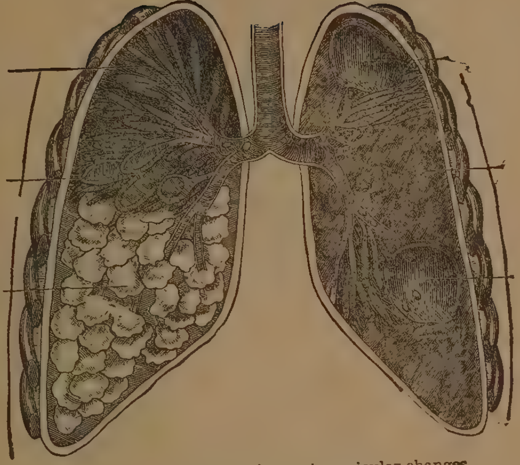


FIG. 1.—Pleuro-pnuemonia.



consumption ; intervesicular changes.

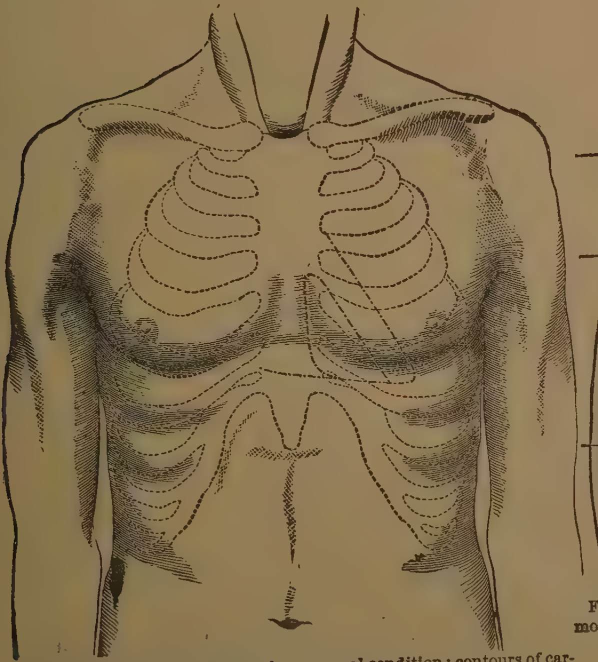


FIG. 3.—Surface of the breast in a normal condition ; contours of cardial torpor to the left of the breast bone. The spaces included in the dotted lines represent the intermediate spaces.

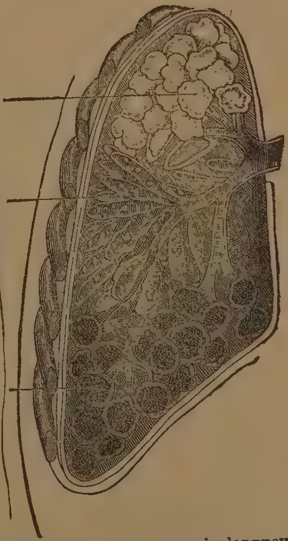


FIG. 4.—Croupous or vesicular pneumonia. Estate of consolidation.

present upon the lips, which are of a dusky hue. Prostration, feebleness, headache, restlessness and delirium at night are common. The tongue is dry and coated, the thirst is eager, but the appetite for food is lost and the bowels are costive.

5. In favorable cases, these symptoms which have been detailed gradually increase up to the fifth, sixth, or seventh day and may then rapidly subside, the temperature falling to the natural standard two or three days later, and the solidified portions of the lung clearing out occasionally with wonderful celerity. The cough and dyspnœa speedily abate, and the sputum becomes yellow and muco-purulent. When the malady ends fatally, death usually occurs about the end of the first or early in the second week, and results from failure of the action of the heart, or else from pulmonary embarrassment.

Treatment 1.—There is no doubt that the intense pain accompanying the onset of pneumonia can be promptly relieved by blood-letting; but since the tendency of the disease is toward death by debility and it is impossible to say in any given case how far over the pulmonary structure the inflammation will extend, we can never feel sure that the loss of the vital fluid abstracted will be safely borne by the patient. In very robust persons, in the prime of life, it is proper to bleed; because the chance of diminishing the violence of the attack thereby is at least equal to the danger of seriously decreasing the strength. In less vigorous individuals, leeching or cut-cupping, and in patients of feeble constitutions, dry-cupping, will generally afford considerable relief.

2. Large doses of quinine, even as much as twenty or twenty-five grains, may be given at the first onset, in the hope of cutting short the disease and later on for the purpose of reducing the fever, which in itself is a great cause of danger, as already explained. Opiates in the form of Dover's powder, the hypodermic injection of morphia, or of codeia in half-grain doses, when the latter medicine suits the patient, are of great service in diminishing suffering, procuring sleep and allaying cough.

3. Toward the latter part of a severe attack the chief treatment is that of nutrition and stimulation, and as there is often in this disease a great tolerance by the nervous system of alcohol, such as we see in typhoid fever, immense amounts of milk punch, or diluted brandy and whiskey, are sometimes consumed with apparent benefit. Alcoholic stimulants should never be given to the extent of producing symptoms of intoxication, but short of this point they are of great service in keeping up the action of the heart and thus preventing the fatal effect of cardiac failure.

4. Since the immediate cause of death in many examples of fatal

pneumonia is the over-distension of the right side of the heart, with consequent separation of fibrin in the partially stagnating blood constituting heart-clot, it is advisable to diminish this tendency to coagulation of the blood in the heart and the production of a thrombus by the administration of five grains of carbonate of ammonia every three or four hours, which, however, ought not to be continued for more than a day or two.

Diet.—During convalescence from inflammation of the lungs danger from relapse is not nearly so great as in many other maladies, such, for example, as diphtheria and hence free indulgence of the appetite for all wholesome food and out-door exercise, as soon as the strength permits, may be allowed.

LUNG DISTENSION (EMPHYSEMA).

Varieties.—The two varieties of emphysema are, first, the vesicular, in which the vesicles are distended and dilated, and the interlobular, in which the air has escaped from the air-cells in consequence of their rupture, and diffused itself through the connective tissue of the pulmonary substance. This condition is commonly the result of accidents leading to great straining in the respiratory muscles, as in the violent paroxysms of whooping-cough and of asthma, and men or animals who are the subjects of emphysema are popularly and very accurately described as "broken winded."

Symptoms.—The symptoms of emphysema are in direct proportion to the amount of lung-tissue affected, and consist of dyspnœa which resembles that of asthma and is unlike that of valvular disease of the heart in being especially marked during the effort at expiration. Cough is usually present, but is not attended with expectoration, unless the disease is complicated with chronic bronchitis, as is frequently the case. In bad cases of emphysema the interference with the aëration of the blood is so great that the complexion is dusky and the patient languid and dull.

Treatment.—The treatment of this disease is limited to palliating the symptoms as much as possible, and remedying the maladies, such as chronic bronchitis or asthma, with which it is frequently complicated. Anodynes, which appear urgently called for to relieve the pain and distress must be employed with caution on account of the imperfect aëration of the blood, which is already an element of danger. Dry cupping between the shoulders is often of service and the use of quinine, iron, and strychnia, as directed in anemia, is beneficial by improving the general health. Change of residence to a warmer and more equable climate than that of the northern United States is probably the best remedy we can urge upon patients afflicted with emphysema.

CONSUMPTION OR PULMONARY PHTHISIS.

Character.—Tubercular phthisis or true pulmonary consumption is that form in which the peculiar tubercular matter is deposited in the lungs in small masses or tubercles, varying in magnitude, but generally about the size of a mustard seed. Such tubercles become centres of irritation, inflammatory action and suppuration, or formation of abscess, and these processes end by destroying a smaller or larger spot of the lung-substance, and leave a cavity or vomica in the pulmonary structure.

Causes.—The disease is constitutional, apparently hereditary, and according to the researches of Dr. Koch, the celebrated Berlin miscroscopist, contagious, the whole malady being the result of development in the lung of a very minute bacterium, named by Dr. Koch the bacillus tuberculosis. In America it is usually developed between the time of puberty and the twenty-fifth year, and in nine cases out of ten seems to be primarily lighted up by a cold or some depression of the nervous system.

Early Indication.—Hemoptysis or spitting of blood, usually in small quantity and only serious as a symptom of very grave import, is often one of the earliest indications of pulmonary consumption.

Galloping Consumption.—Acute phthisis or galloping consumption is the most rapid form of this terrible disease, and has been known to prove fatal in the short space of six weeks. It usually commences with chills and fever of the hectic type. Cough, dyspnœa on very slight exertion and out of all proportion to the apparent amount of disease in the lungs, is almost a characteristic of the complaint. The expectoration soon becomes profuse, and is frequently tinged or streaked with blood. This blood is never mixed throughout the sputum so as to give it the color of rusty iron, which is so indicative of pneumonia. The pulse is frequent and feeble, the tongue red and furred, the appetite poor or absent entirely, and there is often a tendency to diarrhœa.

2. In the rapid progress of the disease there is, after a few weeks, great exhaustion, profuse sweating, speedy emaciation and restlessness, amounting in persons of nervous temperament to delirium. Acute phthisis coming on in this way is almost without exception fatal, but in rare cases there may be a decrease in the violence of the symptoms, and the patient enjoys a temporary improvement, only, however, to pass into the ordinary condition of chronic consumption.

Treatment.—The treatment of some of the very few cases which have ever been reported as cured was that of rest in bed, a liberal supply of fluid nutritious food and stimulants, frequent application of iced-cloths to the chest to subdue the fever, these being at once removed if there was any tendency to faintness thereby produced, hypodermic injections of atropia to check the sweating, and pills or powders containing two grains of quinine, a half grain of digitalis, and opium in amounts of from a quarter to half a grain, four, five or six times daily.

CHRONIC PULMONARY CONSUMPTION.

Symptoms 1.—The onset of chronic pulmonary consumption is generally gradual, and marked by one or more of the symptoms of progressive debility and by loss of flesh, chronic dyspepsia, diarrhœa, alterations in the voice, and in females suppression of the monthly periods. In more than half the cases spitting of blood occurs, and a cold or cough is apparently the starting-point in very many instances. A dull, aching pain just below the collar-bones in front or the shoulder-blades behind is very often complained of, even whilst the amount of tubercular deposit is small, and is probably due to little spots of pleuritic inflammation. Muscular pains in various parts of the frame are often present. The short, dry, hacking cough of early phthisis is usually referred to some irritation about the larynx or trachea, but is, in reality, due to irritation of the bronchial mucous membrane.

2. Weakness of the voice and hoarseness are very common, and a purplish mark upon the edges of the gums, where they come in contact with the teeth, is often observable, and is thought by some physicians to have considerable diagnostic value. In at least fifty per cent. of the patients spitting of blood appears early, and recurs at various intervals, giving the first positive evidence of the existence of consumption. Very rarely, however, is the expectoration of blood in the early stage of consumption directly dangerous to life.

3. Among the other symptoms loss of strength is one of the most constant. The patient soon finds that slight exertion, such as ascending a little hill, or even a short flight of stairs, causes fatigue, hurries the breathing and often gives rise to palpitation. The uterine functions in women are apt to be disturbed, and the liver becomes congested and tender. The tongue gets red and irritable, and little sores called apthæ form upon its sides and on the mucous membrane of the fauces.

4. Hectic fever coming on toward evening and giving a deceptive

appearance of the flush of health to the emaciated countenance develops. There is a total loss of appetite with great thirst, and the loss of flesh is almost visible from day to day. The hair grows thin and loses its attachment to the scalp. The debility is extreme and exhaustive night sweats make their appearance. In females there is a total cessation of the menses, which is a most discouraging evidence of failure in vital power. An unmanageable diarrhœa often sets in and conspires with the other causes of debility to utterly prostrate the unfortunate invalid. The lower limbs become very painful, and dropsical swelling of the feet and ankles appears, constituting what is vulgarly called the bloating consumption.

5. Toward the close, cough and abundant expectoration become, if possible, even more troublesome. Great nervous restlessness, cramps in the legs, pain about the loins, distress in passing water, utter prostration and the ever present difficulty of getting the breath, tend to render the last few nights of existence most agonizing.

Diagnosis of Consumption.—It is so important that the diagnosis of consumption should be made at the earliest possible period, when the chance of life by change of climate is greatest. After the disease is fully developed, and the abundant expectoration, great loss of flesh and strength, night sweats, and associated sore throat from laryngeal tuberculosis manifest themselves, there is often no room for doubt that consumption has developed, even without the aid of auscultation and percussion; but in the incipient stage just grounds for suspicion are furnished by the presence of slight hacking cough which has resisted the usual remedies, a little spitting of blood, provided the patient can be sure that it does not come from the gums or from the back part of the nose, and marked dyspeptic symptoms with loss of flesh and strength out of proportion to the length and apparent severity of the illness.

Treatment 1.—The treatment of consumption consists in the palliation of symptoms and the administration of tablespoonful doses, thrice daily, of cod-liver oil, the phosphates or hypophosphites of iron, lime, and the alkalies; the internal and external use of iodine, and last but not least, of persistent counter-irritation over the diseased spot in the lung, generally near its top and just below the collar-bone, with tartar emetic ointment. Nearly all the cases of recovery from well-defined phthisis, coming under the observation of the writer, have been apparently due in large measure, to this system of treatment.

2. In the second stage of consumption, that is, after the deposit of tubercular matter has begun to soften and before any large cavities have

formed, the prospect of cure by this or any other treatment is diminished; but even from the third stage—that of the formation of large cavities and extensive destruction of lung-tissue—recoveries occasionally occur.

3. The palliative treatment of consumption further consists in relieving the cough and pain in the chest by expectorants and anodynes, improving the appetite and strength by tonics and stimulants, controlling the diarrhœa with astringents and correcting the derangements of digestion with antacids and other anti-dyspeptic remedies.

4. Most patients afflicted with phthisis will find themselves for a time benefited by, first, a cough mixture composed of acetate of morphia, cyanide of potassium, syrup of squills, and syrup of wild cherry or syrup of tolu, as already suggested, used chiefly at night to promote sleep in the nocturnal hours and allow the expectoration necessary to relieve the lungs from their accumulated load of sputum to be carried on in the daytime; second, by a pill of two grains of quinine, half a grain of digitalis, and one-fortieth of a grain of strychnia, with the addition of half a grain of iron, should the condition of anema exist and there is no tendency to spitting of blood to forbid its employment; third, by a mixture of a teaspoonful of syrup of krameria, five grains of prepared chalk, twenty drops of compound spirit of lavender and ten of wine of opium, to check diarrhœa when that appears; and fourth, by powders containing five grains each of bismuth, soda, charcoal and pepsin, or ten of lacto-peptine, with wineglassful doses of the infusions of gentian or columbo, as may be found best adapted to the particular case as stomachics.

5. For patients with whom morphia or opium disagrees, codeia, lactucarium, chloral, bromide of potassium, or hyoscyamus may perhaps be substituted, and in some instances morphia, where illy borne alone, becomes quite acceptable to the stomach when associated with one one-hundredth of a grain of atropia, or with twenty grains of bromide of potassium.

6. When obstinate diarrhœa torments the invalid, the metallic astringents, such as half a grain of sulphate of copper, or one-quarter of a grain of nitrate of silver, thrice daily, are frequently useful, and occasionally a teaspoonful of powdered resin succeeds in controlling the intestinal disorder when all other remedies prove unavailing. The profuse and debilitating night sweats may be often checked by sponging with finely-powdered alum and whiskey, by full doses of quinine, or by hypodermic injections of the sulphate of atropia.

7. Seeing, however, that the prospect of curing consumption by medical treatment is so mournfully gloomy, it becomes doubly important

to urge that every patient whose circumstances will admit should resort to a change of climate. And this migration ought to be made with scarcely a day's delay after some amply competent authority has determined by thorough examination the necessity of such a change in the colder seasons of the year.

PLEURISY.

This disease is an inflammation of the pleura, or delicate membrane which surrounds each lung.

Causes.—Pleurisy presents itself under two forms—the acute and the chronic. Its common cause is exposure to cold, but sometimes it arises from injury, as, for example, from the pleura being wounded by the jagged end of a broken rib; or, secondarily, adjacent inflammation, such as takes place around a nodule or tubercular deposit in consumption, or in the course of some other disease, for instance, Bright's disease or scarlet fever.

Symptoms 1.—The onset of acute pleurisy may be insidious, but generally, when arising from its usual cause, exposure to a very severe cold, it is rather sudden and marked by repeated chills. As soon as the patient reacts from these, the temperature begins to rise and thus furnishes a distinguishing symptom which often enables the complaint to be discriminated from pneumonia.

2. At the same time, or very soon after the rise in temperature, pain, cough and dyspnœa are observed. The pain is almost always referred to the affected side, a few inches below the nipple, and is sharp and darting, described as resembling a stab with a keen knife, especially on trying to take a deep inspiration or to cough. As a rule, the difficulty of breathing is slight and mainly due to the pain in the side and to the febrile excitement in the system. The cough is short, hacking, and accompanied with little or no expectoration; the pulse is quickened; the tongue is somewhat furred, the appetite impaired, but the thirst is increased, and the bowels are confined.

3. After a variable period, averaging, perhaps, between one and two weeks, the attack usually terminates in recovery, with or without a contraction of the wall of the chest on the affected side, according as the lung is able to expand after being compressed by the effused fluid; or the malady may end in the chronic form of pleurisy, or very rarely in the uncomplicated affection it may have a fatal result.

4. In chronic pleurisy the effused liquid remains in the pleural sac,

without becoming absorbed. It is especially apt to become purulent in a short period in children, or in persons whose health is impaired from any cause. When this degeneration takes place there is always more or less febrile disturbance of a hectic type set up in the system generally. The skin of the affected side after a while becomes, over the seat of the effusion, reddened, tender, swollen and dropsical. The finger nails are often clubbed, as in consumption, and night-sweats are not infrequent. Cough is apt to be troublesome and may be accompanied by an expectoration of muco-pus, which in rare cases possesses a putrid odor.

Diagnosis.—The diagnosis of pleurisy without the aid of auscultation and percussion, must often be difficult, at least for the first few days of the attack, but it can sometimes be made from pneumonia by the lower grade of fever, the small amount of dyspnœa, and the total absence of rusty expectoration. It can be distinguished from bronchitis by the small amount of cough, and the sharpness of its pain, and from acute phthisis by the strength being but slightly diminished.

Treatment 1.—The treatment of pleurisy in the first stage, when acute pain is the most prominent symptom, is bleeding, leeching or cupping over the affected side, if the patient is robust and previously in good health. In persons of feeble constitution it is better to apply ten or twelve dry cups, and then use hot poultices with laudanum for the further relief of pain, than to deplete the system. If suited to the patient, hypodermic injections of morphia are of great service. After the second day free watery purgation by a tablespoonful of rochelle salts, epsom salts, or a bottle of citrate of magnesia, and a restriction of the amount of fluid taken into the stomach, are advisable, in order to limit the tendency of effusion into the pleural sac as far as possible. If the febrile movement runs very high, veratrum viride or aconite, in three- to five-drop doses of its tincture, may be given to reduce the pulse and heart's action, but this is rarely necessary.

2. In the second stage after effusion has occurred, the chief indication is to reduce the amount of this serous liquid as speedily as possible, and for such a purpose diuretics and saline purgatives or elaterium, in quantities of half a grain every three hours, or so as to cause abundant watery discharges, may be given; counter-irritation by iodine and small blisters being kept up over the diseased side of the thorax. If the liquid is effused in large amount and causes much interference with respiration, it may be necessary to draw it off by means of an aspirating apparatus.

Diet.—As the cure progresses tonics, good nourishing food and early exercise in the open air in suitable weather, are highly important.

Hydrothorax.—This is the name applied to that diseased condition where there is an accumulation of water or serous fluid in the cavity of the chest. It may be the result of pleuritic inflammation, but not unfrequently occurs in dropsy without inflammatory action. Sometimes it increases to an enormous amount, pressing on the lungs and displacing the heart, with such great interference to the respiration and circulation as to prove the immediate cause of death, unless removed by aspiration, or exhaling the breath through an opening in the pleura.

Pneumothorax.—This is the term applied to the morbid state in which air has entered and partly occupies the cavity of the pleura, compressing the lung in the same way though less forcibly than does a watery effusion. This accident sometimes occurs from the rupture of the vesicles of the lung through the pleural membrane into the cavity of the pleural sac. At other times it results from some injury to the chest, such as a gun-shot wound or the fracture of a rib. Where closure of the aperture by which this air found an entrance can be secured, it may be necessary, in order to relieve the oppression of breathing, to pump out the air by means of the aspirating apparatus.

Emphysema.—This is the accumulation of air under the skin in the subcutaneous connective tissue; it is a curious result occasionally met with from wounds of the pleura, such as those produced by compound fractures of the ribs and other causes. This distension of the integument with air may progress until all semblance of humanity is lost and yet entire recovery takes place. It may almost always be prevented by proper attention to the primary injury.

Other Diseases of the Pleura.—The membrane of the pleura may be affected with cancer, simple tumors, tubercle and parasitic growths, but these are very uncommon, except as secondary manifestation of extensive disease of the same kind in other portions of the body, in which cases the latter are consequently the proper subjects of whatever treatment becomes needful.

CURATIVE MEDICINE.

PART VII.

DISEASES OF THE DIGESTIVE SYSTEM.

In considering the maladies of the digestive system frequent references must be made to the anatomy of the alimentary tract, and to the physiology of digestion.

LIP DISEASES.

Among the common diseases of the lips are ulceration and fissure, which may often be induced to heal by light applications of nitrate of silver solution, in conjunction with diligent improvement of the general health. Cancer of the lip is not uncommon among men in advanced life, but is less frequent in females. It should be operated on in accordance with the rules already laid down, in discussing the subject of cancer. Hare-lip is a curious malformation, in which the upper lip has failed to develop in such a way as to unite in the centre previous to birth, and the child is left with a deep cleft, sometimes reaching all the way from the edge of the nostril. This malformation can generally be remedied by a surgical operation.

STOMATITIS OR INFLAMMATION OF THE MOUTH.

This is commonly met with in young infants, and is called "baby's sore mouth." It consists of an inflammation of the mucous membrane of the mouth and tongue.

Causes.—These may be:

1. Mechanical, chemical, thermal or parasitic.
2. Poisons, as mercury or lead.
3. In certain debilitating diseases, as consumption or diabetes.
4. It is most commonly found in young children, in connection with digestive disturbances, due to artificial feeding and bad hygienic surroundings, especially during the summer months.

General Symptoms.—There are six chief subdivisions of stomatitis, and seven general symptoms common to all varieties. These are heat, pain and redness of the mouth, increased salivation, foul breath, restlessness and disinclination to nurse.

VARIETIES OF INFLAMMATION OF THE MOUTH (STOMATITIS).

I. ACUTE OR SIMPLE STOMATITIS.

This is the most common form of inflammation of the mouth, and is usually the result of the action of irritants. It is frequent at all ages and is especially common in unhealthy subjects suffering from digestive disturbances.

Symptoms.—General redness. There may be areas of marked congestion where irritation is most intense. Mastication is painful.

Treatment.—In infants the mouth should be carefully sponged after each feeding. Chlorate of potash and sulphite of soda as mouth-washes and gargles, of the strength of a dram to four ounces of water, are useful, or, in severe cases, a dilute solution of nitrate of silver (three or four grains to ounce) may be applied, and attention ought to be paid to improving the general health by the use of tonics, nutritious food, and so forth.

II. APHTHOUS STOMATITIS OR FOLLICULAR STOMATITIS.

This is characterized by the presence of small raised spots or vesicles, which may rupture, leaving small ulcers, surrounded with a red bole. This form of stomatitis occurs most frequently in children under three years of age. There are usually some digestive disturbances present.

Treatment.—Correct digestive disturbances; sterilize the milk; nurse at regular intervals, and cleanse the mouth with a linen rag after each nursing. Apply to mouth and gums three or four times a day.

	LATIN.		ENGLISH.	
℞.	**Acid boris**	**gr. xv**	**Boric acid**	**15 grains**
	Glycerini	f℥ss	Glycerine	½ ounce
	Aqua q. s. ad	**f℥ij**	**Water up to**	**2 ounces**
	M.			

If the disease does not yield to this treatment, touch the ulcers with solid nitrate of silver stick.

III. PUTRID SORE MOUTH OR ULCERATIVE STOMATITIS.

This variety occurs especially in children after the first dentition. It is thought by some to be infectious, as it at times occurs in widespread epidemics. It attacks both adults and children.

Symptoms.—It occurs with low condition of nutrition. The gums of the lower jaw are chiefly affected. They are swollen, red and spongy. There is increased salivation, the teeth become loose, the breath foul and mastication painful. In rare cases there is necrosis (decay) of lower jaw.

Treatment.—Correct the hygiene. Touch ulcers with nitrate of silver, and use as a mouth-wash a solution of chlorate of potash, fifteen grains to the ounce. The best remedy is chlorate of potash, given internally, in doses of ten grains, three times a day, to a child, and double that amount to an adult.

IV. PARASITIC STOMATITIS OR THRUSH.

This disease is dependent upon the growth of an irritating fungus (Saccharomysis albicaus). The development of thrush over the whole lining membrane of mouth and throat is very common shortly before death in wasting diseases, such as consumption and diabetes. It may occur at any age, but is especially common in children.

Symptoms.—It begins on the tongue as slightly raised pearly spots, which spread and coalesce. The membrane can be scraped off, and is readily recognized under the microscope. It may spread to the pharynx, esophagus or larynx.

Treatment.—Correct the hygiene; treat any gastric disturbances. Tonics are often indicated. Locally, use sulphite of sodium, one dram to the ounce of water, or

Borax	1 dram
Glycerine	2 drams
Water	6 drams

Apply two or three times a day to gums and mouth.

V. GANGRENOUS STOMATITIS, OR CANCRUM ORIS OR NOMA.

This terrible, but fortunately rare, disease is usually seen in debilitated children, between the ages of two and six years. It usually follows one of the specific fevers, especially measles and whooping-cough.

Symptoms.—The general symptoms of stomatitis are marked. The mucous membrane is first affected, usually of the gums or of one cheek.

The process begins gradually. Externally the cheek is swollen hard, red and glazed, and inside the mouth is seen an ulcer with a great deal of proud flesh or slough.

Treatment.—Good hygiene; alcoholic stimulants; nutritious food and tonics, as iron, quinine and strychnia. Locally, there is nothing that will do much good, but the actual cautery applied to the surface is said to be of some use, as is the application of fuming nitric acid, followed by soda, the surrounding parts being protected with lint soaked with oil.

VI. MERCURIAL STOMATITIS OR SALIVATION.

This form is very seldom seen at present, except in those who work in mercury.

Causes.—It may be caused by the administration of mercury in any form. It is most commonly produced by large doses, or even small doses, of calomel in those who are especially susceptible.

Symptoms.—Those first noticed are tenderness of the gums, manifested by forcibly bringing the teeth together, redness of gums near the insertion of the teeth, a metallic taste and an increased flow of saliva. If the disease is not checked at this stage these symptoms will become accentuated, and there will be profuse flow of saliva, foul breath, redness, swollen and tender gums. In severe cases there may be ulceration of the gums.

Treatment.—The administration of mercury should be suspended as soon as there is the first symptom of salivation. Bowels should be opened by magnesium sulphate (half an ounce); best taken in half a glass of water before breakfast. Hot baths should be taken every evening, and alkaline waters should be taken in large quantities. Atropine sulphate, one one-hundredth of a grain may be taken twice a day, and iodide of potassium, five drops, three times a day.

DISEASES OF THE GUMS.

These generally require the care of a dentist, and when connected with affections of the teeth, or their sockets in the alveolar processes, are usually so painful that prompt application to a dental practitioner is made.

Inflammation of the Gum.—This when conjoined with ulceration at the root of a tooth, gives rise to horrible suffering which lasts for three or four days, when it is usually relieved by the discharge of matter or pus. This may be hastened by hot applications.

Treatment.—The pain can be somewhat mitigated by anodynes, such as ten grains of Dover's powder or one-sixth of a grain of morphia, and poultices, but the best treatment is the extraction of the offending tooth, or the perforation of the alveolar process to the seat of trouble by drilling a hole through the spongy bone.

ABCESS OF THE GUM OR GUM BOIL.

This is sometimes followed by ulceration, which may be hard to heal unless the whole cause of the difficulty is removed, which can now be accomplished under nitrous oxide gas so quickly, painlessly and safely, that no time should be lost in resorting to it. One extremely skillful operator in Philadelphia has now administered the gas for operations on the teeth in over one hundred thousand cases without a single fatal result.

Hypertrophy and atrophy of the gums are sometimes met with.

DIFFICULT DENTITION.

Treatment.—A very common cause of diseases of the stomach and bowels, and also of convulsions in children, is to be found in the hardening or induration of the gums at the time of teething, and this blunder of nature's ought to be promptly remedied whenever the gums in infants at the time of the first dentition are found to be red, swollen, and hot to the touch, by the use of the lancet. This little operation of lancing the gums, which, simple as it is, has probably saved the lives of thousands of young children. After the incisions are made bleeding should be encouraged, but care must be taken by wiping it off with a handkerchief to prevent the infant from swallowing the blood. It is astonishing what relief is often afforded to the little sufferer by a timely lancing of the gums.

Gum Tumors.—Tumors of various kinds sometimes make their appearance upon the gums, the most common of those which are non-malignant being the fibrous growths called epulis, often apparently caused by the irritation of diseased and neglected teeth. They all usually require surgical operations for their removal.

Perforation of Palate.—Perforation of the hard palate or roof of the mouth is sometimes a malformation present from birth, and due to the same kind of arrest of development as hare-lip. At other times it may be

THE TONGUE.

FIGURE No. 1.

1. Hyoides bone joining many muscles of the tongue.
2, 2. Muscles fastened at the corners of the jaw-bone to pull in the tongue.
3. Muscle formed by the outer edge.
4. Deep muscle which turns the tongue toward the side.
5, 6, 7. Muscles which facilitate the turning of the food in the mouth.
8, 8. Salivary glands.
9. Muscle of the bottom of the mouth.
10. Cross muscle formed by the lip.

FIGURE No. 2.

1, 1. Muscles which form the outer border.
2. Hyoides bone.
3, 3. Muscles which move the base of the tongue.
4, 4. Exterior insertion of transversal muscles.
5, 5. Junction line of the transversal muscles.

FIGURE No. 3.

1. Tonsils or glands of the throat.
2. Base of the epiglottis or valve to close the windpipe in swallowing.
3. Lateral arches.
4. Muscles joining the tongue to the epiglottis.
5. Blind apertures in the base of the tongue called "blind foramen."
7. Nerve endings like thread.
8, 9. Fungiform nerve endings.
10. Apex of the tongue.

FIGURE No. 4.

1. Exterior muscle of the tongue.
2. Apertures of mucous glands.
3. Apex.
4. Under muscles with the cover removed.
5. Periglottis turned back.
6, 7. Conduits at the base of the tongue.
8. Nerve endings at the base.
9. Salivary glands.
10. Muscles joining the tongue to the epiglottis.
11, 12. Depressions upon the periglottis.

FIGURE No. 5.

1, 2. Salivary conduits.
3. Wharton conduits.
4. Sublingual gland.
5. Branches or arms of the jaw-bone.

FIGURE No. 6.

1. Nerve endings of the tongue.
2, 2, 2. Submucous pellicle.
3. Muscular larynx (deep).
4. Band which joins transversal muscles.
5. Transversal bands of the muscles.
6, 6, 7, 7. Salivary conduits.
8. Muscles for pulling in the tongue.

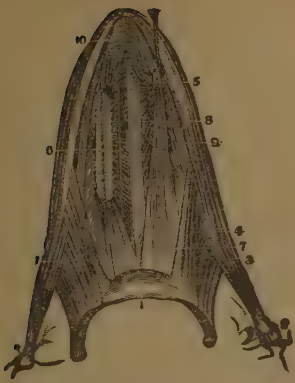


FIG. 1.—View of the muscles of the tongue—lower surface.

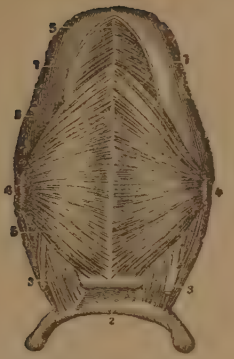


FIG. 2.—View of the under surface of the tongue. with its muscles.

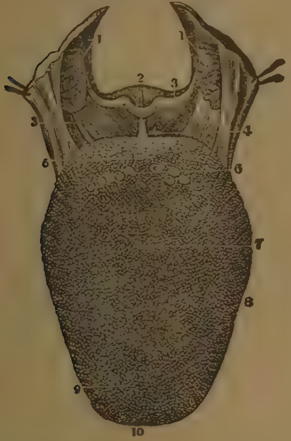


FIG. 3.—Front view of the upper surface of the tongue; as also of the arch of the bone of the palate.

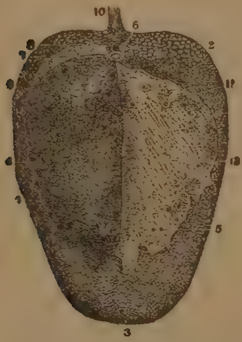


FIG. 4.—View of the back of the tongue, from which, by maceration, the periglottis has been removed and turned back on the right side.

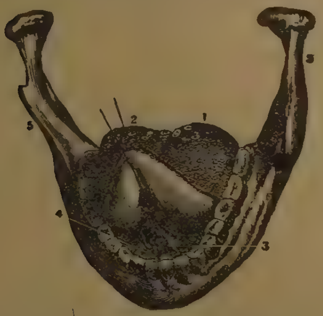


FIG. 5.—View of the lower jaw bone with the tongue turned up.

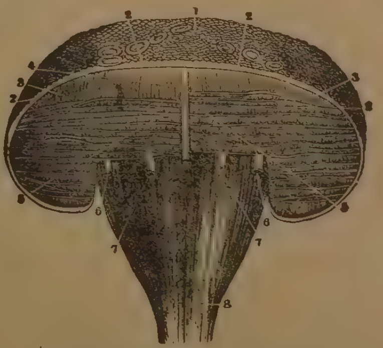


FIG. 6.—View of a section of the front part of the tongue, seen from behind.

THE TONGUE.

For an explanation of the illustrations see text on opposite page.

due to venereal or scrofulous disease. A surgeon can do much to cure this deformity by operation, or to remedy the defect if incurable by surgical appliances, which substitute most ingeniously the deficient portions of the mouth.

DISEASES OF THE TONGUE.

The Tongue is subject to almost all the diseases already spoken of as affecting the inside of the mouth, for which similar treatment is required. Troublesome little ulcers on the tongue can often be promptly cured by holding in contact with the sore a pinch of powdered borax for ten or fifteen minutes. Deeper ulcers may require touching with the solid nitrate of silver, and if dependent upon the constitutional taint of syphilis will be very difficult to heal without the use of internal remedies also.

CANCER OF THE TONGUE.

Cancer of the Tongue appears sometimes to have its origin late in life from the local irritation of the stem of a pipe in habitual smokers, or from the sharp corner of a broken or isolated tooth. Hence it is important to avoid these exciting causes as much as possible. The operation for removal of cancer when seated in the tongue is more justifiable than almost any other, because, if recurrence should take place in the glands of the neck, or still better, in some internal organ, death comes to the victim in a much less painful and horrible form.

TONGUE-TIE.

Tongue-tie is a malformation in which, from the prolongation of the little membranous band, called the frænum, underneath the tongue, the organ, even to its very tip, is in some cases tied down to the lower jaw. If, as occasionally happens, it interferes with a baby's nursing, it should be operated upon the next day after birth by nicking the band at the front edge, and then tearing it back to about the usual position. No cutting operation should be resorted to, except in this very superficial way, on account of a very active little artery which lies at the root of the tongue, and which, if wounded, might bleed so as to endanger an infant's life before the hemorrhage could be checked. On this account, if nursing is not seriously interfered with, it is better to wait some months before thus untying the tongue.

DISEASES OF THE THROAT.

Sore throat, which may be considered as comprising inflammation of the mucous membrane lining both the fauces and the pharynx, as they nearly always occur together, is one of the commonest disorders. It is occasionally produced by attempting to swallow some irritating article of food, or poison, but is ordinarily the result of cold. It also occurs in the course of various febrile affections, such as scarlet fever.

Symptoms.—The symptoms are pain on swallowing, redness of the surface, and at first dryness, but after a day or two later, excessive secretion from the mucous membrane. Subsequently to partial recovery from an acute sore throat, the condition may be one of relaxation, the membrane remaining loose and flabby, and often thrown into projecting folds. This state usually follows cold and sore throat, but may be induced by mechanical causes, such as severe, hoarse cough, screaming, shouting, or over-straining in reading or singing. It may also be brought on by excessive smoking.

Clergymen's Sore Throat.—One form of this malady, called clergyman's sore throat, is the result of excessive use of the voice in church service when the health is already impaired, especially when the air of the apartment in which such exertion is made has been rendered impure by overcrowding. In bad cases of sore throat, the inflammation may go on to ulceration, especially if neglected. The generally relaxed condition of the throat is partaken of by the uvula, or palate, as it is incorrectly called by many people, and this hanging down lower than it ought, may cause a hacking cough by tickling the epiglottis.

The above is a description of sore throat in general. The most common form of inflammation of the throat is tonsillitis.

TONSILLITIS OR INFLAMMATION OF THE TONSILS.

Causes.—The disease is most common in the young. It is rare in infants. Exposure to cold and wet with bad hygienic surroundings seem to be the chief exciting causes. Some writers claim that there is a close relation between this and rheumatism, but Osler has not found the relation between the two very striking, except in one point, viz., "that an attack of acute rheumatism is not infrequently preceded by an attack of inflammation of the tonsils." Personal susceptibility and heredity play an important part in its productions. At times it runs through a family, or a community, with such rapidity as to suggest an infectious origin.

Symptoms.—In the mild forms there may be no other symptoms than redness and dryness of throat with painful swallowing. The tonsils may be felt as hard lumps just behind the angle of the jaw.

Symptoms of More Severe Forms.—In the more severe forms it may begin with a chill followed by a rise of temperature which in children may reach as high as 105 degrees Fahrenheit. Pains in the back and limbs are not uncommon.

Local Symptoms.—The local symptoms are those of the mild form accentuated. If only one tonsil is swollen the uvula is drawn to the affected side.

Follicular Form.—In this variety white patches may be seen covering the tonsil. These are due to the accumulation of degenerated epithelial and white blood cells in the depressions, or cryps, in the tonsil.

Diagnosis.—The follicular form must be distinguished from diphtheria. The membrane of diphtheria is not in patches, but continuous over the surface of the tonsils, and extended up upon the pillars of the fauces and uvula, and is greyish-white in color. When this is stripped off it leaves a raw bleeding surface, which is not the case when the contents of the cryps are expressed in follicular tonsillitis.

Constitutional Treatment.—Bowels must be freely opened with calomel, one-quarter grain every half hour, for six doses; followed by magnesia sulphate (epsom salts), one-half ounce, to be given one hour after last dose of calomel; ten grains of Dover's powder at bedtime. Salicylate of soda is often beneficial, and may be given as:

℞.—Salicylate of soda	5	drachms
Iodide of potassium	2½	"
Syr. sarsaparilla	1½	ounces

Water sufficient to make four ounces. Take one drachm every four hours. The dose must be reduced in children to about half.

Local Treatment.—Gargles of borax, ten grains to the ounce, or salt and water, hot. The following will be found very serviceable:

℞.—Tincture chloride of iron	1	ounce
Glycerine	1	"
Chlorate of potash	½	drachm

Shake well before using, and use one drachm of the mixture to one ounce of water, as a gargle. Clean teeth after using.

Sprays of glyco-thymoline or super-renal extract are good; or swab throat with nitrate of silver solution, ten to twenty grains to the ounce.

QUINSY OR ABSCESS OF TONSIL.

This disease is a cause of great suffering to some persons in youth and middle age, but is rare in childhood, and often ceases its molestations after individuals commence the decline of life.

Causes.—Exposure to cold and wet are its common exciting causes.

Symptoms.—In the catarrhal form of quinsy the inflammation is often superficial, and after causing much pain and difficulty of swallowing, subsides in three or four days without suppuration. In the severer variety an abscess or boil forms in the substance of the tonsil, attended with great pain and swelling, difficulty of swallowing, a good deal of fever, and some loss of strength. The patient often suffers from earache, and is somewhat deaf on account of the inflammation extending along the Eustachian tube. The breathing through the mouth is much interfered with, but the danger of suffocation is apparent only. The disease lasts on an average about seven days, but the abscess may break on the fifth day, or may linger until the tenth day, unless earlier opened by the lancet. The complaint is very apt to recur, and the sufferer from one attack rarely escapes without several every winter, until the tendency, which may be hereditary, is exhausted.

Treatment.—The treatment consists in an effort to abort the disease by leeching, externally, and the use of guaiacum in teaspoonful doses of the tincture four times daily, by the mouth. If these remedies fail, poultices of little bags of hops dipped in hot vinegar and sprinkled with laudanum, and hypodermic injections of a quarter of a grain of morphia, may afford some relief. When suppuration is established, the period of suffering can be abbreviated by lancing the swelling in the throat, provided the spot where the abscess points is high enough to be felt by the finger. The operation is performed by having a long, narrow-bladed knife wrapped with sticking-plaster, to within a quarter of an inch of its point, and then passing this down the throat, guarding it with the finger, and guided by the touch, as the patient can rarely open the mouth wide enough to admit of seeing, a small incision is made into the softened portion of the tumor. The relief afforded either by puncture in this way, or by spontaneous rupture, is wonderfully great. No after-treatment is necessary; but, as before mentioned, the complaint is very liable to recur, and it often happens, that in persons who are strongly predisposed to it, the first imprudent exposure on venturing out will light up the disease in the opposite tonsil, with an almost exact repetition of the suffering, within two weeks.

DISEASES OF THE ESOPHAGUS OR GULLET.

Inflammation of the Gullet.—This is a rare affection, and is usually due to swallowing some hot or corrosive liquid, although it may occur from the extension of simple or erysipelatous inflammation from the throat, or of the former variety from the stomach. Ulceration is also uncommon, although it does occur in connection with syphilitic complaints.

Stricture of Gullet.—This is the most frequent form of disease of the gullet.

Varieties of Stricture—1. Spasmodic stricture is a narrowing of the tube, caused by simple contraction of its muscular fibres. This condition is especially met with in hysterical females, and, though alarming at the time, seldom proves fatal to life.

Traumatic Stricture—2. This is the variety in which the constriction has been caused by irritation and inflammation due to an injury inflicted on the surface of the tube, in any part of its length, by the swallowing of scalding water or of some corrosive substance, or by a wound. The result of such a stricture is to render the act of swallowing always difficult, unless relieved by a surgical operation.

Simple Organic Stricture—3. This is occasionally seen, in which there is a mere narrowing of the gullet, without any apparent tendency to ulceration. The most common and fatal form of stricture is that due to cancerous deposit and ulceration. It may cause death by producing a complete obstruction, so that neither food nor drink can enter the stomach, or by ulcerating into some of the adjoining vital structures. The surgical operations sometimes performed for its relief are of very doubtful benefit or propriety.

ACUTE GASTRITIS OR INFLAMMATION OF THE STOMACH.

The simplest and most common form of inflammation of the stomach is characterized by active congestion and excessive secretion of mucus, a condition known under the name of gastric catarrh, and very similar to that so frequently met with in the throat and air-passages.

Causes.—The causes of this malady are indigestible food, especially in children, irritant poisons, or alcoholic excess. But it may occur in connection with gout or as a symptom in some of the eruptive fevers.

Symptoms.—The symptoms of acute gastritis are pains, which are often severe over the pit of the stomach, shooting through to the back, and increased by taking food, but temporarily relieved by vomiting. Tenderness over the pit of the stomach is always present, and nausea and vomiting are prominent symptoms, the vomited matter consisting of a glairy mucus, stained with bile of a greenish-yellow or bright green color. The tongue is coated with fur, whilst the edges and tip are frequently red and irritated. The bowels are apt to be confined, and the urine scanty and high colored. These symptoms often set in with chilliness, followed by restlessness, hot skin, headache, and other febrile symptoms. In bad cases there may be great prostration, with cold, clammy skin, a weak, rapid pulse, some difficulty of breathing, and obstinate hiccough. Generally, however, under proper management, these distressing symptoms subside after a time, although they sometimes pass into those of the chronic form of gastritis.

General Treatment.—The treatment of this disease is, in the first place, if consequent upon the introduction of some poison or irritating material, to get rid of the offending substance by means of an emetic, followed by a purgative, which is perhaps in most cases best administered by enema.

Diet.—The food should be entirely liquid, and given in very small quantities; in fact, most cases would do better if nutritive injections were depended on to sustain life for a few days or a week or two. The thirst may be relieved by sucking small pieces of ice, but iced champagne is sometimes borne by the stomach when everything else is rejected, and iced carbonic-acid water is often acceptable.

Medicinal Treatment.—With the exception of subnitrate of bismuth, in quantities of five grains, and drop-doses of diluted hydrocyanic acid, it is usually advisable not to provoke the irritable stomach with medicines, the hypodermic injection of morphia being used to relieve pain, if the patient can take morphia, or morphia and atropia, in doses of one-eighth of a grain of the former and one one-hundredth of the latter in that way without nausea being produced. Thin and light poultices, as, for instance, of flaxseed meal and laudanum, laid over the region of the stomach, are frequently of service, or if the pain is very severe a few leeches may be applied. Convalescence from this malady is generally slow, and requires great care in regard to diet and exertion.

DYSPEPSIA.

This affection, the great torment of civilized life, is to be considered rather as an unnatural functional difficulty than as a structural disease.

Varieties of.—Among its three chief varieties may be mentioned:

First Form.—The form due to sympathetic relations with other organs which are themselves in a morbid state, and which is therefore explainable as a reflex action. Of such a type is the nausea and occasional vomiting which attends irritation of the brain, lungs, liver or uterus. Sea-sickness is believed to be a form of this reflex dyspepsia.

Second Form.—This form is attributable to a scanty secretion of gastric juice, and is characterized by slowness of digestion, long retention of food in the stomach, prolonged distress after eating, especially with feelings of weight and uneasiness at the pit of the stomach, a tendency to decomposition of the food in the alimentary canal with the evolution of fetid gases and the appearance of undigested food in the evacuations from the bowels. The food may be considered to be delayed in the stomach when it remains there for more than two or three hours. Dyspepsia of this kind is often inherited, but much can be done to aggravate the tendency by mental over-exertion, prolonged and intense anxiety, especially if commencing directly after meals, sedentary habits, gluttony, and the use of alcoholic and other stimulants.

Third Form.—This form of dyspepsia appears to be owing to some abnormal quality of the gastric juice, and to diminished peristaltic movement of the stomach, so that food is not sufficiently mixed up with the digestive fluids.

Symptoms.—One of the most characteristic symptoms of this condition is pain at the cardiac end of the stomach, to which the name of cardialgia has been applied, on account of the distress being in such close proximity to the heart. Many dyspeptics, being also more or less hypochondriacs, imagine from this symptom that they are subjects of organic disease of the heart, and suffer intense, yet groundless, mental anxiety on that account. The names of heartburn, pyrosis and water-brash are applied to slight modifications of this symptom. Tobacco contains a poisonous principle which, in many persons, favors the development of dyspepsia, and some individuals suffer from smoking even a single cigar.

General Symptoms.—Inability to absorb liquids occurs in some varieties of dyspepsia, so that fluid which has been swallowed may be heard splashing around in the gastric cavity on any forcible agitation of the body, the stomach being usually distended to a great extent. As further aids in distinguishing between dyspepsia from deficient secretion of the gastric juice, and deficient motion of the stomach, it should be remembered that in the former neither flatulence nor constipation are generally present, whilst in the latter variety flatulence is one of the most characteristic symptoms and constipation is usually well marked. Some of the worst cases of dyspepsia from deficient secretion of the digestive fluid, in which pain after taking food, and other symptoms are particularly severe, appear entirely free from flatulence. The tendency of the fermentation which goes on in the slowly digesting food seems to be of a kind in which gases are not evolved. In all these forms there is a loss of appetite. The tongue is usually broad, pale and flabby. The pulse is weak, soft and compressible, and palpitation of the heart frequently occurs. There may be dyspnœa on exertion and a short dry cough, the stomach-cough of the older authors. The general nutrition, of course, suffers, and the face is pallid and bloodless to a greater or less degree.

Treatment—Diet—1. The treatment of dyspepsia must be chiefly dietetic, although medicines are not powerless in this complaint. In the first place all indigestible food, such as pork, veal and salt meats, and richly-made dishes, such as pastry of every description, ought to be avoided. In the acid forms of dyspepsia, which are connected with deficient muscular movement, pastry and saccharine substances are particularly harmful, and vegetables and fruit should be partaken of sparingly. In some instances an exclusive milk diet, persevered in for some weeks, has appeared to produce marvelously good results; but, except under such a regimen, water ought to be the habitual drink. Cocoa, deprived of its fatty ingredients, is often much to be preferred to tea and coffee, and these accessory foods, if taken at all, should be weak, cool and well diluted with milk. Rich or effervescent wines should be avoided, but the lighter Rhine wines or ale, or extract of malt, are often useful in atonic dyspepsia, with impaired movement of the digestive organs. In order to improve the general health all the agencies which favor the improvement of the nutrition and enrichment of the blood, such as abundant exercise in the fresh air, tepid or cool bathing, and warm clothing should be pressed into service. The successful prescription of a famous English physician to a rich and indolent patient who came to him complaining of the tortures of dyspepsia was, "Go and live on a shilling a day and earn it."

Medicinal Treatment—2. In the medicinal treatment for dyspepsia accompanied by undue acidity, as evidenced by the frequency of heartburn, if the urine is scanty and lets fall an abundant deposit, alkalies, such as the bicarbonate of soda or potash in quantities of ten to twenty grains thrice daily, are useful, and are best taken three or four hours after a meal. In acidity with anemia and debility, mineral acids, such as the diluted nitro-hydrochloric in five-drop doses, serve the purpose better.

Vegetable bitters, of which columbo in doses of a wineglassful of the infusion thrice daily generally proves the mildest, and nux vomica or strychnia are good digestive tonics, and in slow digestion benefit is sometimes derived from very minute doses of ipecacuanha.

A good prescription is

℞.—Tincture nux vomica	5½	drachms
Tincture cinchona syrup	2	ounces
Tincture gentian syrup	2	"

Take one drachm three times a day.

For vomiting, besides the remedies already spoken of under gastritis, very small quantities of Fowler's solution of arsenic, in two-drop doses, or creasote mixture may be tried. For flatulence the aromatic carminitives, such as ginger and cardamon, and powders of two grains each of charcoal with bismuth, also counter-irritation by means of small blisters over the stomach are often of great service. When the secretion of gastric juice is scanty, pepsin or lactopeptine, in quantities of ten grains, frequently proves itself invaluable as an aid to digestion; or a prescription containing

℞.—Dilute hydrochloric acid	2½	drachms
Pepsin (soluble)	2	"
Glycerine	1	ounce
Elix. aromatica	2	ounces
Water, sufficient quantity for	4	"

Take one drachm of the mixture in water three times a day. Best taken through glass tube.

CANCER OF THE STOMACH.

The stomach is one of the most frequent seats of cancer, which is especially apt to attack this organ in men advanced in life who have subjected their digestive apparatus to more or less constant irritation. The tendency is very often hereditary. The cardiac end of the stomach is generally the seat of epithelial cancer, and the pyloric extremity of hard cancer or scirrhus. Its tendency is to extend around the organ, and hence it leads to an annular or ring-like constriction.

Symptoms.—The symptoms are those of gastritis or mere dyspepsia at first, but after a few weeks or months, in a majority of instances, a small amount of blood is vomited, and serves to indicate pretty clearly the true nature of the case. The blood in cancerous hematemesis of this kind being effused slowly and in small quantity is altered by the action of the gastric juice so as to present a brown color. This tint and the minute clots in which it appears have caused the expressive name of coffee ground vomit to be applied to it. Although not an infallible sign, it constitutes one of the surest early evidences we possess of the existence of cancer of the stomach. This disease is distinguished from gastric ulcer, which it most resembles, by its occurrence in advanced life instead of in the young; by the presence of a hereditary predisposition; by the character of the hematemesis; by the greater diffusion of the tenderness; by the constancy of the pain; by the cancerous cachexia, and, as emaciation advances, by the increasing tumor, which can be distinctly felt in most cases through the thinned walls of the abdomen. The average duration of cancer of the stomach is from six months to one year, and it always proves fatal.

Treatment.—The only treatment which offers any hope of recovery is surgical.

ULCER OF THE STOMACH.

Causes.—This remarkable disease is attributed to the corroding action of gastric juice on the very membrane which has secreted it, in consequence of the vitality of that membrane becoming impaired by thrombosis of some small artery in the wall of the organ. Disorder of menstruation may develop an ulcer, tight lacing or any occupation which necessitates constant leaning over, as in shoemaking or tailoring. It is more common in females than males, and is more frequent in young women than those of middle or advanced age. Traumatism or swallowing any corrosive substance may lead to ulceration. Anderson believes that alcoholism, syphilis or mental worry may lead to the condition.

Appearance.—A simple gastric ulcer is round or oval, about one-quarter to one-half of an inch in diameter, with thin, clean-cut margins as if punched out, but deepest in the centre, like a shallow funnel, though varying in depth from a mere destruction of the mucous membrane to complete perforation of all the coats. It is usually single and most commonly situated at the back of the organ near its lower or pyloric orifice. The ulcer may happen to eat into some large blood-vessel, in which cases serious or fatal hemorrhage is apt to occur.

Terminations.—The terminations of such an ulcer are the favorable ones of its healing up with or without puckering in the wall of the stomach, or, on the other hand, of perforation, which may occur with the escape of the contents of the stomach into the peritoneal cavity. Such an accident is generally followed by peritonitis and almost certain death.

Symptoms.—The symptoms of gastric ulcer are pain and tenderness over the pit of the stomach, this pain coming on shortly after taking food, and increasing until the organ is emptied by vomiting. Sometimes the distress seems to extend through into the back. The seat of tenderness coincides with that of pain, and is localized over a comparatively small surface. Vomiting of blood occurs in about one-third the cases, and though not so frequent as in cancer is much more profuse. It may be either in black clots or fresh blood, and not infrequently blood is passed by the bowels. Vomiting of food half an hour or an hour after eating is usual, and various dyspeptic symptoms are met with. The pain is often described by the patient as of a gnawing character, and is commonly made worse by condiments, animal food, saccharine substances and alcohol; whilst the pain in neuralgia of the stomach is frequently relieved by these articles of diet.

Medicinal Treatment.—The most successful treatment of gastric ulcer is perfect rest in bed and nourishment entirely by nutritive injections, for a period of from one to three weeks, or until the subsidence of the pain and tenderness indicate the healing of the ulcerated spot. Prussic or hydrocyanic acid and bismuth, as directed in gastritis, may be given to control vomiting, and morphia hypodermically, guarded if needful by atropia, to relieve pain. Stomach should be washed out twice a day. Small blisters over the stomach are frequently useful, and the first food administered should be lime-water and milk in very small quantities, gradually increased as the power of the organ to retain food is found to be restored. If vomiting of blood comes on, perfect rest, the quieting of the peristalic motion of the stomach and whole digestive tube by full doses of a grain every two hours of opium, or one-sixth of a grain of morphia, and the use of acetate of lead by the stomach in quantities of two grains every three hours, tannic acid and gallic acid by enema, and five grains of ergotin hypodermically, are to be resorted to. Ice in small pieces may be given frequently, and cold cloths applied over the gastric region. Perforation is indicated by severe pain and shock.

Surgical Treatment.—If the patient grows worse in spite of medical treatment, if hemorrhage is profuse, if pain is severe, or if the tenderness is marked, surgical treatment must be resorted to and should only be done by a skilled surgeon. A number of cases of perforation and hemorrhage have been saved by a surgical operation.

PERITONITIS.

Character.—This dangerous malady is an inflammation of the peritoneum or serous sac covering the intestines, liver, spleen, and so forth, and reflected upon the inner surface of the wall of the abdomen. It is probably more liable to become quickly and violently inflamed than any other structure of the body. It may be either general or local. Local peritonitis may occur whenever any of the organs of the abdominal cavities become the seat of inflammation.

Causes 1.—Exposure to wet and cold.

2. Traumatism.

3. It may result from the perforation of an ulcer occurring in stomach, intestines or liver.

4. Inflammation of the uterus following confinement and constituting child-bed fever, which we see.

5. It may be secondary to some morbid disease as tuberculosis, rheumatism or Bright's disease.

Symptoms.—A chill with moderate fever, rapid pulse, intense abdominal pain, abdominal rigidity, painful respiration. The patient lies with thighs flexed, features are pinched, vomiting persistent and bowels are usually constipated.

Treatment.—Absolute rest is essential. Restrict the diet. Give frequent doses of opium, one grain, or morphine, one-quarter grain. Hot or cold applications to the abdomen. In non-perforating cases give saline purge. In perforating cases, which are the most frequent, a surgical operation offers the only hope.

ENTERITIS OR INFLAMMATION OF THE BOWELS.

Symptoms.—This disease is not very common, but may arise from taking cold, from the abuse of purgatives, from swallowing or inhaling irritant poisons, and from peritonitis. Its symptoms are diarrhœa with pain, often very severe, increased on pressure and most intense about the navel or in the right flank. The frequent discharges temporarily relieve the griping pains, which, however, soon return. The pulse is excited, generally full and strong and marked fever is present.

Treatment.—The treatment is by anodyne fomentations or poultices to the abdomen, such as the flaxseed poultice with laudanum, and grain doses of opium by enema or suppository. Rest in bed must be strictly enjoined.

APPENDICITIS OR INFLAMMATION OF THE APPENDIX.

Function of Appendix.—Appendicitis is the term applied to inflammation of the vermiform appendix. It is almost invariably the primary lesion of all those various conditions known as typhlitis or perityphlitis, terms which are well relegated to obscurity. The appendix is a small tube or diverticulum coming off from the postero-internal part of the cæcum or beginning of the large bowel, and has no function in man, but in herbivora and rodents is a functionally active organ. The position of the appendix corresponds about to a point two inches from the anterior spine of the pubis on a line down from the spine to the umbilicus. This point is known as McBurney's point.

Causes.—At one time it was supposed that foreign bodies, as seeds, pins, etc., were important etiological factors in the production of the disease, but Fits' statistics show that only twelve per cent. of cases are caused by foreign bodies. Appendicitis is a bacterial disease, usually produced by the bacteria which are nominally present in all parts of the gastro-intestinal tract, which have a powerful action when the vitality of the appendix becomes impaired from any cause, as when the deverticulum is bruised, obstructed, or in a state of catarrhal inflammation.

Where non-traumatic inflammation occurs the swelling of the mucous membrane occludes the tissues, obstructing the full communication between the appendix and cæcum, and the appendix becomes converted into a closed sac. Dieulafoy maintains forcibly that appendicitis is always caused by the conversion of the appendix into a closed cavity. Partial obstruction may be caused by calculi, which are composed of fecal material mixed with salts of lime or magnesia. These calculi are not formed in the colon but in the appendix. Pozzi believes that appendicular colic may be caused by bending of the appendix, and holds that pain may arise when there is no lesion of the appendix. A foreign body may produce immediate perforation giving rise to a diffuse septic peritonitis. Where the lesion of the appendix is occluded it begins to swell and becomes very much congested, the blood supply becomes lessened or cut off entirely. The microbes multiply with great rapidity and the wall of the appendix may become gangrenous, or it may ulcerate and perforate. Interference with the blood supply of the appendix will predispose to appendicitis.

When the appendix becomes inflamed gradually, the peritoneum around it partakes of the process and adhesions are usually formed, thus walling off the appendix. In a case of this kind, if perforation should occur or the inflammation go to the formation of pus, the adhesion would protect the general peritoneal cavity from the poisonous materials.

Who Are Most Subject.—Appendicitis occurs most frequently in males, as the blood supply is more abundant. It is rare in infants but occurs most frequently between the ages of sixteen and thirty years. Appendicitis that subsides may at any time recur, and the life of the patient is under constant menace. It always recurs after a second attack.

Varieties.—Appendicitis is divided into the catarrhal, obliterative, suppurative and gangrenous forms, but as a matter of fact appendicitis is always one disease which varies in intensity, and it is useless to divide it into a number of symptomatic groups.

Symptoms 1.—In what is known as appendicular colic there are colicky pains in the right iliac region most marked over McBurney's point but radiating towards the umbilicus, nausea, vomiting and usually constipation, but no tenderness in the right iliac fossa or abdominal rigidity.

2. In a genuine case of appendicitis the patient feels listless and out of sorts for two or three days before the attack, loss of appetite, furred tongue, foul breath and constipation is the rule, but in exceptional cases there may be diarrhœa.

3. The onset is usually with colicky pains which at first may be general over the whole abdomen but most intense over McBurney's point. Circumscribed tenderness over McBurney's point and across may be felt. There is moderate fever and vomiting is usually present with constipation, abdominal muscular rigidity.

4. As the attack progresses the fever becomes more intense, radiating towards the umbilicus and the tenderness over McBurney's point recrosses. The pulse increases and fever rises, vomiting becomes worse, respiration more rapid and thoracic in character. The patient lies upon the back with right leg drawn up. The urine is scanty and highly colored. Any case may become suddenly desperately grave because of perforation or gangrene.

Terminations.—Appendicitis may terminate in recovery, in death, or in a condition of lowered vitality, renewed attacks being certain to occur.

Treatment 1.—In appendicular colic apply a hot water bag over McBurney's point, give a saline cathartic and watch the patient for further symptoms.

2. Many surgeons give a cathartic in undoubted cases of appendicitis, but the increase peristolsis and tension caused is liable to give rise to perforation.

3. In a genuine case of appendicitis perfect rest, liquid diet, ice bag to McBurney's point. Do not use opium in any form as it masks the symptoms. If the symptoms are not better in thirty-six hours operate. Deaver and Murphy operate in every case.

4. McBurney says, if six hours after the beginning of the attack the patient is no worse there is no pressing danger, if in twelve hours symptoms are not intensified they will soon begin to abate, but if in twelve hours the symptoms have become worse operation is necessary.

5. It is always better to operate in the interval between the attacks than during an attack. It is not safe to delay operation in a pus case. It must be remembered that the mildness of the symptoms is no assurance that even in an hour or two gangrene or perforation will not occur.

INTESTINAL OBSTRUCTION.

This term is applied to the obstruction of any part of the intestinal canal. It may be acute or chronic.

Causes.—Obstruction may be caused:

1. By a band, which becoming looped or attached to one or more organs, forms a noose through which the intestine slips. This manner of compression is known as strangulation.

2. By one portion of gut slipping into another. This is known as intussusception or invagination.

3. By kinking of the gut.

4. By the narrowing of the lumen, by contraction of scar tissue or the encroachment of tumors.

5. By the pressure of foreign bodies large enough to obstruct the lumen.

Symptoms of Acute Obstruction or Complete Obstruction.—The active symptoms are usually preceded by a period of constipation, with a feeling of lassitude, furred tongue and foul breath.

1. Pain comes on abruptly, first colicky, then continuous and intense.

2. Vomiting quickly supervenes and is, first, of the stomach contents, then bilious, and finally fecal.

3. Abdominal distension occurs if the obstruction is in the lower bowel, but may not be present if the obstruction is high up. Constitutional symptoms are those of shock. Thirst is intense, urine scanty and highly colored.

Symptoms of Chronic or Partial Obstruction.—Symptoms appear gradually with the increase of the narrowing until there is complete obstruction, or the symptoms of acute obstruction occur from time to time.

Treatment.—Purgatives are contra-indicated. Food must be withheld and nutrition given only by the rectum. Give opium or morphine for the fever in doses of one grain of the former and one-quarter grain of the latter.

Accessory Treatment.—Washing out the stomach twice a day to control the vomiting. Distension of the bowel with gas or water should be practiced in doubtful cases and in intussusception. Senn recommends the infiltration of hydrogen gas. If these methods fail to relieve the obstruction a surgical operation must be done at once.

DYSENTERY.

This is a febrile disease, characterized by severe colicky pains, followed by straining, which results in scanty mucous or bloody stools, containing little or none of the natural fecal matter or excrement.

Causes.—It is especially prevalent in warm climates, and warm weather and bad hygienic surroundings play an important rôle in its production. Ingestion of irritating foods, exposure to cold or wet, certain debilitated states, as scurvy, Bright's disease, etc., seem to be predisposing causes and may alone produce the simple form. The tropical form is due to an animal parasite, the amœba coli.

Symptoms.—There is moderate fever, severe colicky pains in the abdomen, prostration, tenesmus or straining, constant desire to defecate with small mucus and bloody stools. These symptoms are aggravated during the night and early morning, and leave behind them the tormenting sensation that there always remains in the bowels something which has yet to be discharged. This sensation, which is technically called tenesmus, increases, and ultimately becomes the most striking feature of the disease. When the malady is fully established, the evacuations consist of bloody slime, sometimes tinged with bile, and containing shreds of membranous-like exudation thrown off from the interior of the bowels. They exhale an odor almost peculiar to dysentery, very offensive and yet quite different from that of ordinary feces. This complaint may prove fatal in consequence of the great loss of blood, but it more commonly causes death by wearing out the patient.

Other Symptoms.—When a fatal termination threatens, the symptoms assume a typhoid character, with great prostration, dry, brown tongue, hiccough and vomiting. In favorable cases improvement begins about the end of the first week, but convalescence is usually very protracted, and many cases stop half way, as it were, continuing to suffer for months or years with the chronic form of the affection.

Common to Children.—This disease is very common among young children, being especially prevalent and fatal among those who are cruelly kept in cities during the hot summer months, and it is the usual result of starvation or deterioration of food, especially if long continued and accompanied by hardship and privation, being then an extension of the diarrhœa which is apt to be first produced.

Treatment.—A mild laxative is indicated in the beginning as epsom salts, three drachms, or castor oil and laudanum might be selected. Bismuth is a valuable remedy. Absolute rest in bed and bland non-irritating liquid diet. The following may be found useful:

℞.—Sulphate of morphia	½ grain
Bismuth	40 grains
Creosote	15 drops
Simple syrup	2 ounces

A teaspoonful every three hours.

After the more violently acute stage has passed, laudanum injections, or opium by suppositories, with such astringents as two grains of acetate of lead, half a grain of nitrate of silver, and of sulphate of copper combined with small doses of a quarter or half a grain of opium by the mouth, are generally beneficial, but care must be taken not to check the disease too suddenly by the use of these remedies.

Additional Treatment.—Flushing out the bowels with a saline solution may be tried, or starch water containing one grain of opium may be found beneficial. Hot fomentations over the abdomen may be used to relieve the pain. Injections of warm solutions of quinine, 1-5000 have been used in dysentery with advantage. Creolin, a drachm to the pint, has given good results.

Diet.—The diet, as pointed out before, should consist of the blandest and most unirritating substances, such as boiled milk with lime-water, beef essence, boiled rice, and if the debility is extreme, raw eggs beaten up with milk. Stimulants should not be administered unless absolutely necessary, on account of their locally irritating effect.

DIARRHŒA.

Causes.—In many cases this common malady is also rather a consequence or symptom of some morbid condition than itself a disease. The frequent discharge of loose or fluid evacuations from the bowels, without griping pain or tenesmus, is sometimes a wise effect of nature to get rid of some injurious or indigestible material, which has been imprudently swallowed into the stomach and has from there passed into the bowels. Diarrhœa may likewise be produced by some violent mental impression, or by exposure to taking cold, the bowels instead of the throat being often the weak spot of the individual. It also results from privation of food, food of poor quality, and many analogous causes.

Medicinal Treatment.—In the treatment of diarrhœa from indigestible food no attempt should, as a rule, be made at first to check it until the offending material, whatever it may be, is cast out of the system. In fact, a gentle and soothing laxative, such as a dose of castor-oil with a few drops of laudanum to hasten along the conservative action of emptying out the intestinal canal, is often of great service.

Stopping Evacuations.—After this is accomplished, however, each additional evacuation is an evil, which should be prevented by the use of five grains of bismuth or chalk, with three grains of tannic acid, or in a teaspoonful of either syrup of galls, or syrup of krameria, and a quarter of a grain of opium, or by opiates combined with carminitives like lavender, or ginger, and camphor, a good mixture being ten drops of laudanum, fifteen of compound spirits of lavender, and five of spirits of camphor, taken on a lump of sugar every hour or two until relieved.

Additional Treatment.—If the stomach is unsettled, as is frequently the case, the opiate and astringent may be administered with advantage by enema or suppository, and in patients who cannot, or think they cannot, retain medicines in either the stomach or rectum, hypodermic injections of the eight of a grain of morphia may often be resorted to with the happiest effect.

Diarrhœa Mixture.—A good rule in taking a diarrhœa mixture is to use a moderate dose every two hours, provided the loose passages recur within that time, but if at the end of two hours there has been no liquid or semi-liquid evacuation in the interval, to wait until such a one occurs before resorting again to the remedy. In this way the blunder of so overdoing the good work of checking the diarrhœa as to inflict upon the system its opposite evil of constipation may generally be avoided. The patient thus gains from the remedy all the good with as little of the necessary evil, which lurks in the bottom of every cup of blessing, as possible, a desideratum which should constantly and persistently be kept in view in every kind of medical treatment, as well as all other affairs of life.

Other Remedies.—Among the various other valuable remedies often beneficial in this exceedingly common disorder, may be mentioned the tincture of kino, catechu and logwood, acetate of lead, sulphate of copper and sulphate of zinc, nitrate of silver, spirits of chloroform, tincture of capsicum, spirits of camphor, compound spirits of lavender, and so forth.

Accessory Treatment.—In cases of diarrhœa, where the tongue is white and coated, the pulse accelerated, the temperature a little raised, and some pain or soreness, increased by pressure, is felt in the abdomen, small doses of epsom or Glauber's salts, in conjunction with hyoscyamus and opium, and perfect rest in bed with the most rigid attention to diet, are necessary, lest the slight irritation of the mucous lining of the alimentary canal become aggravated into actual inflammation, and more serious disease, such as dysentery, enteritis or obstinate chronic diarrhœa result.

Diet.—The diet of a person suffering from diarrhœa must be very strictly regulated, and, in fact, nothing but tapioca, sago, boiled rice or milk-toast with boiled milk, twice-boiled water, beef-tea and table-tea should, as a rule, be put into the stomach. Even after the malady seems to be cured, much caution must be exercised about returning to the ordinary diet. This disease, like most others indeed, exhibits as it passes away a singular analogy to a conflagration, which for days after it has apparently been extinguished is ready to break out again, if the remaining sparks happen to be fanned into a flame by the wind or any new fuel is supplied.

CONSTIPATION OR COSTIVENESS.

Definition.—This diseased condition, the direct opposite of the preceding one, may be defined as a retention of the fecal matters beyond the usual period, so that they are passed with difficulty and in a comparatively hardened state.

Causes.—The causes of constipation are almost infinitely various. Every form of impaired digestion may originate it; the existence of piles or hemorrhoids, a sedentary life, application to study, amenorrhea and uterine disease in females, all are apt to induce it, and almost every acute disease is frequently ushered in by constipation. It is more often met with among women than men, probably because the female sex fail to exercise sufficiently in the open air; and many articles of food largely contribute to establish the evil of habitual constipation.

Treatment of the Acute Form.—If the trouble be occasional and accidental any of the milder laxatives, such as a tablespoonful of epsom or Glauber's salts, rochelle salt, castor oil—which is the safest purgative, as a rule—ten or fifteen grains of rhubarb, senna, or the various purgative mineral waters may be employed. For some patients, injections of warm water, or soap and water, answer a very good purpose, and if administered with care are perfectly harmless.

Treatment of the Habitual Form.—Habitual constipation is best treated by the regulation of the diet, partaking of fresh or stewed fruits, bran bread and vegetables in season, in proportions sufficient to antagonize the torpor of the bowels; at the same time resorting to active exercise in the open air, and endeavoring to correct any faulty habit of life, which may be the primary cause of the trouble. If the difficulty had its origin in hereditary tendency, or other deep-seated modification of the organism, laxatives should be resorted to, because, in the writer's opinion, at least, the evils of constipation are far greater than those arising from the constant employment of these medicines.

Additional Treatment.—It is probable that for most persons saline laxatives, such as rochelle salts, or purgative waters during the summer, and in cold weather pills of a grain of rhubarb, one-sixth of a grain of podophyllin and a grain of compound extract of colocynth, teaspoonful doses of the compound liquorice powder, or some of the many excellent gentle laxatives recommended in the pharmacopeia, best serve the purpose.

Relieving Constipation.—Obstinate constipation, that is, absence of evacuation for several days, or a week or two, is a dangerous condition, and should never be permitted to occur, since the large and densely-packed masses of feces may require the operation of drastic cathartics to dislodge them, and such medicines, in accomplishing their work, sometimes set up serious or fatal inflammation. Liberal potations of castor oil, aided by large enemas, may first be tried in such a case; then senna, in teaspoonful doses of the fluid extract; then quarter- or half-grain doses of tartar emetic, in conjunction with epsom salts, and if these fail, it may be necessary, under skillful advice of a physician, to resort to drastic cathartics, such as gamboge, calomel, elaterium and croton oil, provided no organic obstruction exists.

HERNIA OR RUPTURE.

Definition.—Hernia is the name usually applied to the protrusion of some portion of the bowel or any abdominal viscera through the wall of the abdomen.

Varieties.—We may have umbilical hernia or protrusion of the bowel at the navel, a form often seen in children; and hernia in the groin or inguinal hernia, which is probably a most common variety. It has been estimated that about one man in every seven is affected with hernia, but in most cases the intestine is kept in its place more or less perfectly by some form of truss. When a hernia can be pushed back it is called reducible.

An irreducible hernia cannot be returned into the cavity of the abdomen, and is constantly in danger of being inflamed, by some accidental blow for instance, and so becoming strangulated.

Causes.—Hernia is sometimes produced or driven out under some treacherous truss, which should protect against such an accident, by very slight causes, all of which should be carefully guarded against by those who have any hereditary tendency to this disease. It may be forced out by a jerk, such as suddenly pulling open a door that sticks, or by a fall, by an attempt to lift a heavy weight or to raise a moderate one whilst in a constrained position, or any other act which tends to bring a strain upon the bowels making them bear downward. It is also favored in its occurrence by overeating, by excessively exhausting exertion, and by severe effort at times when the body is enfeebled by disease. It is more common on the right than on the left side of the body.

Symptoms.—The symptoms of strangulated hernia are intense pain, not only in the neighborhood of the rupture but over the whole abdomen and especially around the navel, obstinate vomiting, and cessation of the passages from the bowels. At first there may be one or two evacuations of the fecal matters already below the seat of strangulation, but after that is cleared out the bowels cease to move, and if the strangulation is unrelieved the vomiting, which persists in spite of all remedies, results in bringing up fecal material through the throat. This is a very curious phenomenon, and seems to indicate that nature in her stupid zeal to get rid of digested materials, on finding that the usual avenue downward is blocked, soon reverses the normal peristaltic movement and tries to evacuate the bowels through the mouth. In accordance with this idea the importance of such stercoraceous vomiting, as it is called, in the diagnosis of strangulation of a hernia, or some similar obstruction, is very great.

Treatment of Strangulated Hernia.—When fecal vomiting occurs, if undecided before, not a moment should be lost in sending for the best medical skill which can be procured, and which even then may arrive too late. In the absence of medical assistance, reduction of an obstinate hernia on the point of becoming strangulated, or perhaps already compressed, may sometimes be accomplished by putting the patient in a warm bath, and so relaxing the system as already explained; or a full dose of opium or morphia, the former preferably by enema, may perhaps have the desired effect; or lastly, the administration of ether or chloroform, by one who is accustomed to giving these anesthetics, by still more fully relaxing the system, may happily allow the endangered fold of the intestine to be pushed back into its proper place. If the hernia cannot be reduced an operation is absolutely necessary and is attended with but very little risk in the hands of a skilled surgeon.

Treatment of Reducible Hernia.—In this form of hernia the contents of the sac can be reduced into the abdominal cavity. The treatment may be palliative or radical.

Palliative Treatment.—Prevent constipation, avoid sudden strains and violent exercise and order a truss. The continual employment of a truss, especially in young persons, may bring about a cure. The day truss should be applied before rising in the morning and be removed after lying down at night when a light truss may be substituted. A truss is always uncomfortable at first, but a person soon grows used to it. It should be kept perfectly clean, and it is well to dust borated talc powder upon the skin under the pad at least once a day. A truss which does not keep the hernia up increases pain and does harm. Too strong a spring tends to enlarge the hernial opening and thus aggravates the cause.

Radical Treatment.—This is operative and the sac is completely closed and a new canal formed. These operations show a very small percentage of recurrences.

INTESTINAL WORMS.

The intestinal canal is often the home of parasites, commonly called worms, and in many parts of the country nearly all children between the ages of one and seven years, as well as many older persons, are troubled with these pests.

Varieties 1.—In childhood the usual inhabitant of the bowels is the round-worm or ascaris lumbricoides, a creature attaining the size of a large earth-worm, which it resembles in appearance, except that it is whitish or brownish, and stiffer and harder in its structure.

2. Children are also often infested with the oxyuris, commonly called the thread-worm, pin-worm, or seat-worm. This parasite is sometimes found in great numbers about and just within the fundament. In size they are very nearly that of a very small pin, or piece of thread about half an inch long, but by their number and activity they often contrive to prove very troublesome guests to their unwilling host.

3. The third common parasite which preys upon the human species is the tænia solium or tape-worm, of which some account has already been given. These parasites are always introduced into the system from outside, either with food or drink, and hence one great reason for the good cooking so strenuously urged in a former chapter. They are a great source

of irritation as long as they remain, and in childhood, by the reflex irritation their movements in the intestines are capable of exciting, constitute one of the common causes of convulsions. Exactly what articles of food convey the eggs of the round-worms and the pin-worms into the human system has not yet been discovered, but the tape-worm is known to find its entrance into our bodies by the eating of raw meat, generally beef or pork.

Symptoms of Round-Worms.—The symptoms are often absent. When present there is usually symptoms of dyspepsia, diarrhœa with mucous stools, colicky pains in abdomen, voracious appetite which it is almost impossible to satisfy. There is anemia and often reflex nervous phenomena such as "night terrors," grinding of the teeth, itching of the nose and anus, twitching of the face and limbs and there may be convulsions.

Treatment.—The diet should be restricted before the anthelmintic is administered. The most effective remedy is santonin, which is best given with calomel, as in the following:

℞.—Santonin	5 grains
Calomel	5 grains
Sugar	20 grains

Divide into ten powders, and take one powder morning and evening.

Fluid extract of spigelia, one to three fluid drachms, often proves very effective.

Symptoms of Pin-Worms.—These chiefly affect the lower colon and rectum, and produce severe itching of he anus and adjacent parts.

Treatment.—Flush out the bowel with water, then inject infusion of quassia chips two to three drachms to the pint of water.

Symptoms of Tape-Worm.—These are frequently absent. There may be dyspeptic symptoms, colicky pains in abdomen, loss of flesh, capricious appetite and at times reflex nervous phenomena as vertigo, palpitation, "night terrors," convulsions, itching at nose and twitchings of limbs and face, especially the latter.

Treatment.—A light diet for a day or two previous to the administration of the anthelmintic, so that the worms will be hungry enough to feed upon the drugs administered. After an unsubstantial breakfast administer one of the following efficient remedes: Pumpkin seeds, two to three ounces, oleoresin of aspidium, one to two drachms; pomegranate, one drachm.

Auxiliary Treatment.—Before giving any of these the bowels should be thoroughly emptied by a good purge, and about twelve hours after the administration of the anthelmintic another purge, preferably castor oil, should be given. The treatment is successful only when the head is passed, so the stools must be watched carefully. If not successful the first time try again in a day or two.

COLIC.

Colic is an acute spasmodic affection of the bowels without diarrhœa or much fever, but attended with severe cramps of the abdominal muscles.

Causes.—Its most common causes are indigestible food, reflex irritation from the uterine or ovarian disease, and lead poisoning.

Symptoms.—The great characteristics of colic are the griping, twisting pains, radiating from the navel and relieved by pressure. Care must be taken not to mistake these pains for those of strangulated hernia, or the converse, which would be a much more serious blunder.

Treatment.—The treatment is to relax the spasm by opiates, and remove the offending material if there is any in the bowels. For the former purpose twenty or thirty drops of laudanum by enema or hypodermics of one-eighth of a grain of morphia, and for the latter a tablespoonful of castor oil or a Seidlitz powder answer very well in most instances.

HEMORRHOIDS OR PILES.

Hemorrhoids or piles are exceedingly common and troublesome complaints, consisting of little tumors which form at the edge or just inside the fundament, and give rise to intense suffering, especially when the bowels are evacuated.

Varieties.—There are three varieties, external, internal and mixed.

Causes.—Their production is favored by constipation, sedentary habits, hard seats, and some forms of liver complaint.

Symptoms.—The inflammatory enlargement is detected and is tender and inflammed. Pain on evacuation of bowels. The external variety do not bleed. Very often their surface, which in the internal variety is composed of the distended mucous membrane, exudes blood, in which case they are called bleeding piles. When seated outside the margin of the fundament they are not so apt to bleed, and receive the name of blind piles.

Treatment.—They may generally be prevented from developing by proper attention to the bowels, non-stimulating diet and rest, and, whilst small, an ointment of ten grains of extract of belladonna, thirty grains of tannin, and twenty grains of powdered opium in an ounce of simple ointment, will usually relieve them.

Auxiliary Treatment.—Injections of cold water into the rectum, bathing the parts with cold water after each bowel movement, or an ointment of

Chrysanrobin	15 grains
Iodoform	5 grains
Extract belladonna	10 grains
Vaseline	4 drachms

Apply three times a day.

Apply this night and morning after carefully cleansing the part. Extract of hamamelis is a valuable application for external piles. When the acute symptoms subside use lead water and laudanum. If the internal piles prolapse and inflame use in addition to the above, Allinghour's ointment on the parts. If the piles are protruding and reduction cannot be affected put the patient to bed, give a hypodermic of morphine sulphate one-fourth grain and apply hot poultices.

Surgical Treatment.—If hemorrhoids do not yield to the above treatment a surgical operation is necessary, which is accompanied with very little danger. It may be done under local anesthesia, but general anesthesia enables an operator to accomplish his task with more thoroughness.

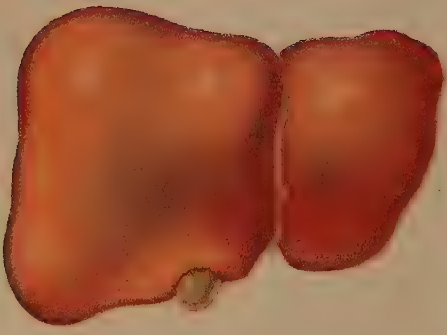
FISTULA IN ANO.

Causes.—Fistula in ano is a very painful disease, in which a communication at the side of the fundament is opened through the flesh into the rectum, or lower bowel, above the sphincter or muscle which ordinarily keeps it closed. It is usually the result of an abscess at the side of the intestine. There are several varieties of fistula, in the worst of which the fecal matters from the intestines constantly leak out through the hole or sinus, and besides causing great irritation and pain, render the sufferer disgusting to every one whom he approaches. Most of these different forms of fistula can, however, be cured by severe surgical operations.

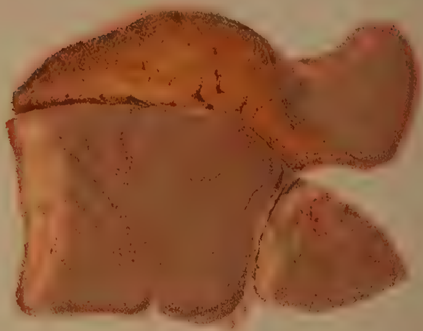
Fissure of the Anus.—This is another painful affection, in which a slit or crack appears in the side of the fundament, often the result of a small ulcer at the edge of the opening. As it must be torn apart every time the bowels move it is very difficult to heal. Sometimes fissure of this kind can be cured by touching the sore with caustic, and using laudanum injections to keep the intestine in a state of comparative rest, but if these fail a surgical operation is the only remedy.

Prolapsus Ani.—Called also falling of the bowel, is the coming down of the rectum, which protrudes outside of the body sometimes to the distance of three or four inches. It generally results from constipation, and

LIVER COMPLAINT.

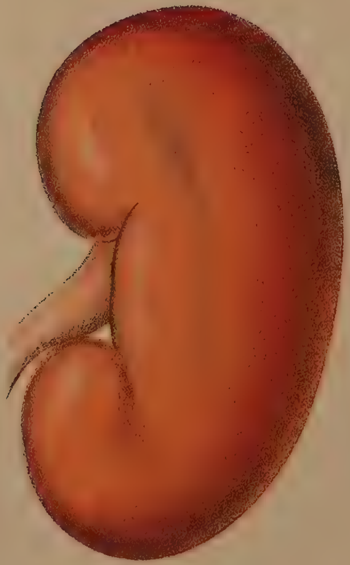


Normal or healthy liver

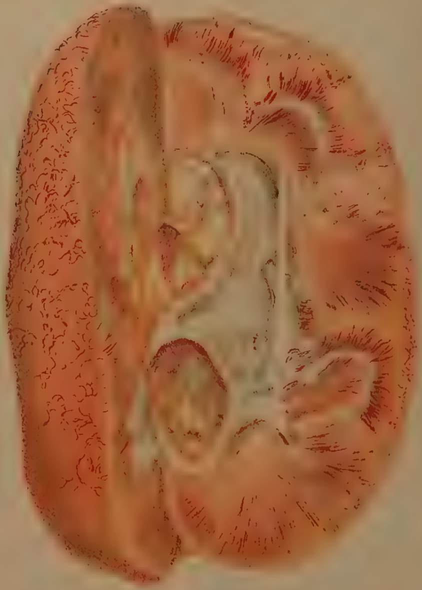


Diseased liver.

KIDNEY DISEASE.



Healthy kidney



Bright's disease

is especially apt to occur in weakly and neglected children. The protruding portion of the intestine should be carefully and gently pushed back to its place with the fingers covered with a well-oiled silk handkerchief, and suitable apparatus obtained from the instrument-makers to keep it in position. Sometimes an operation is necessary.

DISEASES OF THE LIVER.

JAUNDICE.

Jaundice is rather a symptom of disease than a separate malady.

Causes.—It may be due to a suppression of the secretion of bile by the hepatic cells; or, again, by an over-activity of these elements, and a superabundant supply of bile in the system; or, thirdly, by obstruction to the outflow of bile, and reabsorption of its elements into the blood.

Symptoms.—It consists of a morbid yellowness of the skin, the white of the eye and other parts; but in bad cases this yellowness may become so intense as to appear olive-green, brown or even black. The urine is also of a yellow or saffron color, but the discharges from the bowels are pale and devoid of the natural brownish-yellow tint, sometimes having the bluish-white hue of potter's clay. Troublesome itching of the skin, slow pulse, low temperature, debility and a tendency to hemorrhage from the mucous membranes are frequent in jaundice.

Diagnosis.—The most important practical point is to determine whether the gall-ducts are obstructed or not. If they are closed, so that the stools contain no bile, the jaundice speedily becomes intense and the swollen gall-bladder can sometimes be felt below the edge of the ribs. When not obstructed, the reverse is the case. Jaundice which comes on suddenly, is probably due either to a gall-stone or to nervous disturbance. Intense jaundice which has developed very gradually, probably results from pressure outside of the gall-duct, such as would be produced by a tumor or cancer.

Gall-Stones.—Intermittent attacks of jaundice point to gall-stones in old people, and to catarrh of the bile-ducts in children. Paroxysmal pain preceding jaundice points to gall-stones; following jaundice, to cancer of the liver. Jaundice with great enlargement of the liver, if the latter is painful and tender on pressure, indicates cancer; if painless, it suggests the waxy or lardaceous condition of the liver. When jaundice accompanies ascites, it is usually due either to cancer or cirrhosis. The danger of life from jaundice, unless it does indicate some fatal disease like cancer or cirrhosis is small; but in its severer forms it is often very obstinate, lasting for weeks or months.

Treatment.—The treatment consists of small doses of calomel or blue pill followed by a saline purge for a few days, avoiding salivation. The mercurial medicine may be substituted or aided by five grains of extract of taraxicum; podophyllin and leptandrin, in quarter-grain doses, and bicarbonate of soda in quantities of ten grains. Later on in the attack, five-drop doses of diluted nitro-muriatic acid may be administered with advantage, leaving a few days' interval between the last dose of any mercurial and the acid remedy.

Jaundice of Infancy.—It is very common to observe jaundice commence in the first or second day after birth. Usually of no importance. Probably due to diminished pressure in the portal system or to poteut ductus arteriosus. Recovery takes place in a few days or weeks. The severe forms may depend on septic poisoning with inflammation of the umbilical vein, congenital inflammation of the liver due to syphilis or congenital absence of the hepatic duct.

CONGESTION OF THE LIVER.

Causes.—Acute congestion of the liver may result from cold, from over-eating, or from the abuse of alcohol.

Symptoms.—Its symptoms are enlargement of the organ with tenderness on pressure, and a feeling of painful tension on the right side just above the edge of the ribs, often radiating to the right shoulder, slight jaundice, furred tongue, loss of appetite and scanty, high-colored urine are present, and the whole group of symptoms constitutes the condition commonly designated as "being bilious."

Treatment.—It is generally relieved by a small blue pill, or small doses of calomel followed by a saline purgative, and attention to diet for a few days. If neglected this form may run on to chronic congestion or lay the foundation of inflammation of the liver.

ABCESS OF THE LIVER.

Abscess of the liver is the formation of pus in the substance of the organ. There may be one large abscess cavity or many small ones.

Causes 1.—It may be due to injury.

2. The presence in the liver of the amvela culi of dysentery.

3. Foreign bodies, gall-stones and retained bile.

4. Septic emboli which may come through the hepatic artery but usually through the portal vein from other diseased viscera and produce a purulent inflammation of the vein.

Symptoms.—The fever is of the hectic variety, high in the evening and low in the morning. Chills are sometimes present; pain is variable and may be felt in back of right shoulder. The liver is enlarged, painful and tender. Marked jaundice is rare. There may be bulging, and fluctuation is sometimes dectected.

Treatment.—There is only one treatment, which is surgical.

Degenerations of the Liver.—Acute atrophy of the liver, waxy liver, and fibroid deposit in the liver are various forms of degeneration for which little can be done by medical treatment and which are fortunately rare. Not so, however, as far as regards infrequency, with cirrhosis of the liver, called also drunkard's liver and hob-nail liver, because of its origin in the abuse of alcohol and the peculiar contracted form which it presents. The process which the liver undergoes is a condensation of the substance and destruction of the secreting cells, with thickening of the connective tissue. The whole liver gradually contracts, ceases in great measure to manufacture bile and, becoming an obstruction to the venous circulation, produces ascites or abdominal dropsy, under which the sufferer generally succumbs.

LIVER (HEPATIC) COLIC.

Gall-stones are hard concretions which form within the gall-bladder, and when they attempt to pass out through the gall-duct often give rise to the most excruciating agony which the human being is capable of suffering.

Symptoms.—This pain is called hepatic colic, on account of its griping, tearing character, and may generally be distinguished by its coming on and passing off suddenly; by its frightful intensity; by being deep-seated instead of superficial; by being accompanied with vomiting and by the pulse being rapid and feeble. The onset may be marked by a chill and fever. It may last from a few moments to several days, and is often so severe that strong men will sometimes writhe and roll around on the floor, screaming in their agony. It seldom comes on before middle life, and women are much more frequently attacked than men. The pain is chiefly in the upper part of the abdomen on the right side. If a gall-stone remains in the duct for more than twelve hours, it is usually followed by jaundice coming on two or three days later. The affection terminates either by the stone slipping back into the gall-bladder or passing out through the duct into the bowel, in which latter event it may be found in the evacuations during the next week, and should always be searched for. The stone usually varies in size from that of a small shot to an inch or more in diameter, and in color from yellowish-white to dark-brown. If single, it is usually oval or rounded; but if two or more have been formed, the first one is marked by impressions of the others, and thus the prospect of future attacks can be estimated. Notwithstanding the alarming suffering, the danger to life is small, and death rarely eventuates from hepatic colic.

Treatment.—The treatment is by thirty-drop laudanum enemas or hypodermic injections of a quarter of a grain of morphia and one-one-hundredth of a grain of atropia, with chloroform or ether by inhalation, if the pain is unendurable. Hot fomentations, or hot baths, sometimes afford partial relief. In order to prevent the recurrence of hepatic colic, small doses of carbonate of soda, alkaline mineral waters, or a mixture of chloroform and turpentine have been highly recommended.

Value of X-Ray.—The use of the X-ray was found valuable in the diagnosis of gall-stones.

ASCITES OR DROPSY OF THE ABDOMINAL CAVITY.

Symptoms.—The prominent symptom of ascites is the distension of the abdomen, which sometimes becomes enormously swollen, and by the pressure upward of the diaphragm gives rise to distressing dyspnœa.

Treatment.—When possible endeavor to remove the cause. Purge freely with concentrated salines, compound jalap powder twenty to thirty grains, elaterium one-eighth grain. Increase the action of the kidneys by infusion of digitalis two drachms, citrate of caffeine three to five grains, diuretin fifteen to thirty grains.

Auxiliary Treatment.—If the effusion is large and does not yield to the above treatment tapping is indicated, which is a procedure accompanied by very little danger. No anesthetic is required, and it gives almost immediate relief to the dyspnœa. Care must be taken not to draw off the fluid too rapidly, as this might cause collapse.

CURATIVE MEDICINE.

PART VIII.

DISEASES OF THE URINARY SYSTEM.

The Urinary Organs.—The important group of organs which makes up this system comprises the kidneys, two glandular bodies about four inches long, and of the peculiar shape of a kidney-bean, with their outlet pipes communicating with the bladder, and its exit tube the urethra, opening in both sexes in conjunction with the organs of generation.

Office of the Kidneys.—The office of the kidneys in the animal economy is to secrete the urine which passes from each gland down its separate ureter into the bladder, where it may be stored to the amount of half a pint or a pint, and from which it ought, at suitable intervals of from four to six hours, to be evacuated. The ingredients of the urine being waste material, poisonous to the organism if retained in the blood, it will readily be understood why the suppression of the renal secretion, in certain morbid conditions, or its retention in consequence of any obstruction to its outflow, in the narrow ureters or urethra, may give rise to some of the most horribly painful and fatal diseases which mankind is ever called upon to endure.

Function of the Kidneys.—The function of the kidneys is purely an eliminative one, and a full understanding of its performance could only be gained by a study of the intricate structure of the organs, too complex to be considered here. It is sufficient for the present purpose to state, that the blood entering each kidney by its large renal artery is purified by having removed from it the elements of a poisonous substance, urea, with uric or lithic acid, phosphoric acid, and sulphuric acid, variously combined with potash, soda, lime, magnesia, and probably other refuse matters in smaller amounts. These solid ingredients of the urine are dissolved in the forty or fifty ounces of water which is also during health taken out of the blood by the kidneys, and in this way the urine is manufactured. The purified blood, after giving up these deleterious matters in the renal organs, is returned to the general circulation by the renal veins.

Passage of Urine.—In perfect health a man of average size would pass in the forty-eight ounces of urine, which he should daily evacuate from his bladder, an ounce and one-third of urea, nearly an ounce of chlorides, sulphates and phosphates, and from eight to twelve grains of uric acid. If, for any reason, the amount of water filtered out of the blood is less than this, there is danger that some solid constituents of the urine may crystallize within the urine or bladder, and being, perhaps, washed into the ureters in the one case, or into the urethra in the other, block up these outlets and give rise to the horrible agony of nephritic colic, gravel, or stone in the bladder; or, again, even slight inflammation in these small tubes may result in a contraction or stricture, which hinders the passage of the urine, and also causes great suffering to the unfortunate patient.

Guide to Kidney Disease.—The chief guide to diseases of the kidneys is, necessarily, therefore, a chemical and microscopical examination of the urine, with the sediments which fall from it, in each individual case, and this should never be neglected in any but the most temporary and insignificant derangements of the urinary apparatus.

ACUTE NEPHRITIS OR ACUTE BRIGHT'S DISEASE.

Nature of the Disease.—Acute Bright's disease, called also acute nephritis, is a malady in which the kidney becomes greatly enlarged and vascular, with its minute convoluted tubes, in which the urine is primarily manufactured, plugged up with epithelial cells. These epithelial cells in the form of casts of the renal tubules are voided in the urine together with albumen, and sometimes with blood. The obstruction to the outflow of the urine and the interference with the function of the kidney give rise to the most serious general symptoms.

Causes.—Acute Bright's disease is a rather common complication of scarlet fever, and is one of the dangers most to be dreaded in that malady. It also occurs in cholera, yellow fever, erysipelas and diphtheria, and may be produced by alcoholic intemperance, or by exposure to cold and wet, particularly by sitting on a wet or cold object, such as a stone step. Certain poisons which are eliminated through the kidneys, as cantharides and turpentine. Pregnancy is also a potent factor in the cause of the disease.

Symptoms.—The symptoms are, first, in many cases, chilliness, followed by fever, some pain in the loins and across the lower part of the spine, scanty high colored and albuminous urine, and in a day or two dropsy, or watery effusion under the skin, beginning beneath the lower eyelids or in the organs of generation, but soon becoming general over the whole body. Uremic coma may develop at any time.

The Urine.—Scanty always, and at times entirely suppressed. Smoky in appearance, high specific gravity, rich in albumen and throws down a heavy sediment, which, when examined microscopically, will be found to contain hyaline, blood and epithelial casts, and free blood and epithelium.

Treatment.—The treatment, which is successful in a majority of the cases, consists in keeping the patient in bed in a room with a warm, moist and equable temperature, purging gently with those laxatives which cause watery discharges from the bowels, such as small doses of five grains of jalap and thirty grains of cream of tartar, promoting free perspiration by the use of sweat baths, which are given by placing the patient in a tub of water at the temperature of 106 degrees Fahrenheit for twenty minutes. Give a thorough rub and place in bed between blankets with hot water bottles, or hot cans around, but not touching the patient. A blanket should be interposed between the skin and the hot cans. Allow free perspiration for an hour to an hour and a half. Sweating may be aided by giving from one-twelfth grain to one-eighth grain of pilocarpine. Guard against collapse by giving strychnine sulph., one-twentieth grain. Dry cups followed by hot fomentations over loins. In bad cases, with robust patients, cut-cups or leeches may be used in place of the dry-cups, and acetate or citrate of potash in twenty-grain doses, with ten drops of tincture of digitalis or squills, and half a teaspoonful of sweet spirits of nitre are often given with benefit. Citrate of caffeine in one to two grain doses may be tried. Infusion of digitalis in one drachm doses is especially beneficial in children. Diuretin in from ten to twenty grains three times a day for adults, and two to five grains for children will often give good results. Bosham's mixture, one drachm thrice daily. Niemeyer recommends a pill if edema is present, composed of blue mass, powdered digitalis, powdered squill, each of one grain. Take one of these thrice daily. The following combination may prove efficient in troublesome dropsy:

Spartine sulph	4 grains
Caffeine citrate	20 grains
Lithia benzoate	40 grains

Divide into ten powders, and take one every three hours.

CHRONIC BRIGHT'S DISEASE OR CHRONIC NEPHRITIS.

Causes.—It may follow the acute, or may be chronic from the beginning. Males are most frequently attacked. Adult life, frequent exposure to wet and cold, alcoholism and congestion from heart disease and syphilis are the chief predisposing causes.

Symptoms.—The symptoms of well-defined chronic Bright's disease are albuminous urine, containing renal epithelial cells and tube-casts, more or less dropsical effusion, especially noticeable about the face and ankles, anemia, shortness of breath, a peculiar dryness of the skin, dyspepsia headache and giddiness, together with a tendency to dimness of sight and inflammation of the retina of the eye, uremia or blood-poisoning from the retention of the urea, which ought to be removed by the kidneys in the circulating fluid, secondary inflammations, such as pneumonia and pericarditis, and hypertrophy of the heart. Its presence can only be positively ascertained by thorough microscopical examination of the urine, and such examinations repeated from time to time are the best guides as to the necessary treatment. The variety is essentially chronic, running a course of months or years, with a tendency to temporary improvement under treatment, on the one hand, and to subacute exacerbations in consequence of unhygienic imprudences on the other. It almost always proves fatal in the end, however, by uremia with or without convulsions, by secondary inflammations, or perhaps by general debility. It is estimated that uremia causes death in about one-third the cases.

Treatment.—The treatment for chronic albuminuria is in the main hygienic. Residence in a warm and equable climate. A quiet life without mental worry, with gentle but not excessive exercise, is recommended. In addition the bowels should be kept regular, skin active by daily tepid bath with friction. Abundant pure water or some pleasant mineral water should be drunk. The underclothing should be wool or silk, and the diet non-nitrogenous, and in severe cases absolute diet of skimmed milk will prove beneficial, unless dropsy or symptoms of uremia require active remedies.

Further Treatment.—Should the former be very troublesome, and diuretics, as suggested when speaking of the acute form, fail to act, as frequently happens, recourse must be had to the hydrogogue cathartics, such as a quarter of a grain of elaterium, already spoken of, with hot-air or vapor baths to promote elimination by the skin, as a partial substitute for the inefficient work of the crippled kidneys. If marked symptoms of uremia appear, such as headache, drowsiness, involuntary muscular twitchings, sudden and violent vomiting and diarrhœa, recourse to the active cathartics should be had at once, without any preliminary trial of a diuretic, and if uremic convulsions or coma come on, full doses of elaterium or a drop of croton oil will probably be required immediately to avert death. During the convulsion chloroform may be given by inhalation to restrain the violence, and perhaps shorten the paroxysm.

Many cases of uremia are benefited and life prolonged by blood letting of from six to twelve ounces, depending upon the pulse, and followed by an injection of saline solution from one to two pints beneath the breasts, or in subcutaneous structures of the axilla, strength of solution about one teaspoonful of salt to a pint of distilled water, to be injected at about the temperature of 100 degrees Fahrenheit. Care must be taken to thoroughly cleanse the skin at the point at which the needle is to be inserted.

HEMATURIA OR BLOODY URINE.

This is more a symptom of other diseases than a disease in itself.

Causes.—Stevens gives as the causes thus:

1. Vicarious menstruation.
2. Traumatism applied to any part of the genito-urinary tract.
3. General blood dyscrasia as in specific fevers, purpura, malaria, scurvy, etc.
4. Congestion of the kidney from chronic heart, lung or liver disease.
5. Acute inflammation of any part of the genito-urinary tract.
6. Stone in any part of the genito-urinary tract.
7. Varicose veins in neck of bladder.
8. It may occur without obvious cause.
9. Parasites in genito-urinary tract.
10. Tumors and tubercle of the kidney.

The presence of blood may be suspected from the red, smoky or brownish color of the urine, and positively determined by a microscopical examination. If the blood is clotted it generally comes from the bladder, and if coagulated in long round strings, like earth-worms, it may have been effused in the urethra, from a rupture or ulcer in that membranous tube.

Treatment.—The most important thing is to discover the cause and treat that. If this cannot be done tincture of chloride of iron, which is especially useful in debilitated patients in twenty-drop doses every three hours, gallic acid in quantities of five grains, and ergot, or two grains of acetate of lead and half a grain of opium every four hours. The effect of the general remedies may be aided by the injection of a weak solution of alum in cold water, thrown into the bladder by means of a catheter if the case is urgent. Where a large mass of coagulated blood is formed in the bladder it may sometimes be gotten rid of by the injection of a solution of pepsin, which, if the ingenious plan succeeds, dissolves the clot of blood.

PYURIA OR PUS IN THE URINE.

Causes.—1. Suppurative inflammation of the kidney.

2. Calculus (stone) or tuberculosis of kidney.

3. Cystitis or suppurative inflammation of the bladder.

4. Urethritis. Inflammation of urethra.

Symptoms.—Urine is alkaline and has a cloudy sediment. There is usually frequent and urgent desire to urinate, especially if the pus is from the bladder or posterior urethra.

Diagnosis.—Diagnosis can only positively be made from microscopical examination. If from abscess of kidney flow of pus is intermittent. If from calculus or tuberculosis of kidney the flow is constant, as it is in cystitis or urethritis.

Treatment.—The treatment consists in removing the cause.

SUPPRESSION OF THE URINE.

Description.—This is an affection in which the work of the kidneys in secreting the urine is very defective or altogether abolished. There may be some pain in the back or irritability of the bladder, the patient becomes anxious and restless, then dull and drowsy, and finally after an interval of from three to eight days usually dies comatose. In other instances there is nausea and vomiting, hiccough, and the whole body exhales a urinous odor. Where the suppression is less complete, and depends upon some obstruction to its outflow in the ureters, bladder, or urethra, the mind remains clear for a long time, perhaps, and the unfortunate patient is fully conscious of the intense local suffering and general distress produced. The time during which the urine may be suppressed and yet the patient recover varies considerably.

Hysteria.—In hysteria, cases where no urine has been passed for ten days are reported, but such instances are not free from suspicion of possible deception on the part of the patient. Children when teething will sometimes for days together void only a few drops of urine at once, and that at several hours interval. The urine passed at such times is extremely high colored, stains the linen, and is passed with great pain, the child crying bitterly, as it scalds the sensitive surface over which it flows. This disease probably arises, at least in some instances, from over-congestion of the kidney.

Treatment.—The treatment recommended is to place the patient in a warm bath, and give a saline diuretic, such as a teaspoonful of cream of tartar, or twenty grains of acetate of potash dissolved in half a pint of water, combined with a moderate laxative. The sweet spirits of nitre, in half teaspoonful doses, is also frequently useful. Digitalis leaves made into a poultice, or the tincture of digitalis added to a flaxseed poultice, have often proved beneficial, and the digitalis may also be used internally with advantage in the form of a teaspoonful of infusion every four hours.

FLOATING OR MOVABLE KIDNEY.

The mobility of the kidney depends upon the relaxation of the surrounding structures.

Causes.—Females are most usually affected, probably due to the difference in dress between them and the males. Middle life. Any disease producing rapid marked emaciation predisposes to it. A congenital relaxation of surrounding tissues. Muscular exertion. Repeated pregnancies.

Diagnosis is made by feeling kidney in abnormal position.

Symptoms.—There is a dragging sensation in back. Kidney may become swollen and painful to the touch. There is a sense of uneasiness and attacks of neuralgic pains. Emotional disturbances are often excited by this condition.

Treatment.—Use abdominal binder or pad. Regulate diet. Avoid exertion. If the condition persists the only treatment is surgical.

RENAL OR NEPHRITIC COLIC.

Causes.—Since the ureters commence inside the kidneys as funnel-shaped tubes, it is obvious that any solid substance capable of entering the upper part and yet a little too large to pass the lower portion, will stick fast, and can only progress as the pressure of the constantly secreted urine behind it drives it along with sufficient force to dilate the pipe and allow it to move onward. This process of dilatation is horribly painful, and with that of passing a gall-stone, and of certain forms of neuralgia, makes up the worst physical suffering of humanity since the Spanish Inquisition was abolished. The little stones which cause such agony in this way are generally composed of uric acid, or less commonly of oxalate of lime, deposited from the urine inside the kidneys, and washed down from the seat of their formation by the outflow of that fluid. It is not positively determined whether they crystallize out of the urine because they are produced in too large quantity in the system, or because a deficient amount of water to hold them in solution is filtered out of the blood; but in neither case, increasing the bulk of the renal secretion by drinking a larger quantity of water daily, is a most rational method for diminishing the tendency to their production.

Symptoms.—The first symptom of an attack of renal or nephritic colic is usually pain in the region of the loin on the affected side. This rapidly increases in severity until it becomes excruciating, and radiates downward toward the groin, the testicle on that side being drawn up, a symptom constituting in males—who are chiefly the subjects of this malady—an important diagnostic sign. With the pain, nausea and vomiting are apt to occur, and the body is covered with a cold sweat.

Treatment.—The treatment of nephritic colic is to relieve the pain, if only moderately severe, by hypodermic injections of morphia and atropia, or laudanum enemas, as advised in the article upon gall-stones; but if the suffering is intense, by the inhalation of ether or chloroform. In order to mitigate the pain sufficiently by these anesthetics, it is not usually needful to administer them to complete unconsciousness. A few whiffs will lull the distress so as to make it endurable for the time, and as this blessed influence passes off, it can be renewed by a repetition of the inhalation. Persons whose hearts and lungs are healthy, can thus be kept in comparative comfort with comparative safety, for several hours, or until the passage of the stone out of the lower end of the ureter into the bladder renders the anesthetic no longer necessary.

Passage of Stone.—It is probable that both morphia and ether tend, besides, to hasten the exit of the stone by relaxing the spasm, which no doubt is caused by the irritation of the angular corners of the cruel little calculus as it makes its way through the slender and sensitive tube of the ureter. After the passage of a stone of this kind into the bladder, it usually is voided with the urine, in the course of the next day or two, and in order to make sure that the enemy has been completely gotten rid of, it is best to carefully examine all the urine which comes away in the next few days after an attack. The character of the stone, when found, will afford some information as to the best mode of treatment to be adopted for the purpose of avoiding the formation of others of like structure.

Prophylactic Treatment.—Those who are subject to attacks of nephritic colic should live a quiet life, avoiding exertion as far as possible. The diet should be regulated as in gout. Diuretics should be taken and water in large quantities.

Sir William Roberts recommends what is known as the solvent treatment. Citrate of potash in doses of half to one drachm every three hours. Osler has not found this satisfactory. Piperazine in doses of five grains three times a day may prove useful as a solvent.

CYSTITIS OR INFLAMMATION OF THE BLADDER.

Symptoms of Acute Cystitis.—There is great frequency and urgent desire to urinate. The passage of very little urine at each act, accompanied by great pain above the pubis, and in the perineum radiating to the end of the penis and in the loins and sacral region.

The Urine.—The urine, at first clear, loses its transparency, becomes full of thick mucus and contains blood and pus. A rectal examination is very painful.

Treatment.—In treatment of cystitis remove the cause if possible. Put patient to bed, apply hot applications to perineum, give suppositories containing opium, one grain, and belladonna, one-sixth of a grain. Hips should be elevated and bowels opened by salines and glycerine enemas. An exclusive milk diet is often beneficial.

For the pain give a powder containing—

Extract hyoscyamus	4 grains
Extract cannabis indica	4 grains
Sugar	20 grains

Divide into ten powders, and take one every three hours.

Suppositories of ichthyol, one grain, are often beneficial. All alcoholic stimulants must be avoided.

Symptoms of Chronic Cystitis.—In this condition there is frequent urination, but it is not so marked as in the acute form. The urine is ammoniacal, fetid and filled with tenacious mucus and pus; not infrequently blood. Constitutional symptoms rarely appear. Tuberculosis is a frequent cause of cystitis, and by careful straining and examination the bacillus tuberculosis can be found. This form is accompanied by pyuria (passage of urine) and pain.

Treatment 1.—If possible, the cause must be removed. Water is drunk in large quantities. Salol and boric acid, five grains each, every four hours, is very good.

2. Urotropin, five grains six times a day, catheterize twice a day, and irrigation of the bladder with solution of silver nitrate, one grain to a pint of water, or solution of permanganate of potassium (1-20,000). The bladder is washed out by attaching a glass nozzle to the catheter at one end, and to a funnel with rubber tube at the other. The funnel is raised to four or six feet above the patient, and bladder filled, and then

fluid allowed to flow out. This is repeated several times until it returns clear.

CALCULUS OR STONE IN THE BLADDER.

Causes.—It is supposed by some writers to be in part due to the lime and magnesium contained in the hard water used for drinking in certain districts. It is more common in men than in women.

Symptoms.—The suffering is sometimes very severe, and is nearly always felt more or less both night and day. There is a continual and distressing sensation, as if there were retained secretion in the bladder, and more or less subacute inflammation is usually set up. The flow of urine is often suddenly stopped, and continues upon change of position. This is due to the stone obstructing the passage of urine at the neck of the bladder.

Treatment.—The medical treatment is only palliative, and similar to that recommended in cystitis and solvent in nephritic colic. The surgical operations of opening the bladder and taking out the stone, called lithotomy, and of lithotrity or crushing the stone, if of suitable size and texture, within the bladder, by means of a very ingenious instrument, afford, when successful, as they are in a large proportion of cases, a complete cure.

Diet.—After getting rid of a stone, something can be done by the management of the diet, and above all by the avoidance of impure drinking-water, toward escaping the further formation of these dangerous and painful concretions in the bladder. It is important, however, to determine the nature of the calculus removed, and this can only be decided with certainty by a chemical and microscopical examination.

INCONTINENCE OF URINE IN CHILDREN.

Causes and Cure.—Paralysis, irritability and spasm of the muscular coat of the bladder are not infrequent. When the muscular layer is irritable the urine has to be voided too frequently, producing incontinence of urine. This is sometimes a very troublesome affection in young children, often, however, in great part a bad habit, which is cured as soon as it has been broken up, let us say, by an anodyne suppository of one-twentieth of a grain of extract of belladonna and one-quarter of a grain of opium, to a child six years old, for four or five nights in succession.

Adhesions of foreskin to prepuce is often a cause which must be remedied

DISEASES OF THE PROSTRATE GLAND.

Causes and Cure.—Among the diseases of the prostate gland the most important are chronic enlargement and calculus. This gland is situated just in front of the neck of the bladder, and encircles its outlet, the urethra. Hence its enlargement is apt to interfere with the outflow of the urine from the bladder as soon as it increases beyond a certain point. The difficulty thus caused in passing water is especially apt to affect elderly men, and would be very serious had not surgical science supplied a peculiarly formed instrument, called the prostatic catheter, by which the impediment can usually be overcome temporarily.

Inflammation of Urethra.—The urethra, which constitutes the final channel through which the renal secretion flows in making its exit from the body, is likewise subject to inflammation, and to obstruction from calculus, and, most important, to narrowing in consequence of inflammatory action. This contraction of the canal is called, as most people are aware, stricture of the urethra, and notwithstanding the numerous tales of accident producing this trouble, which are poured into the credulous ears of physicians, its true cause is, at least nine times out of ten, gonorrhea, which will therefore be considered in this connection.

GONORRHEA.

Character.—Gonorrhea, or, as it is vulgarly called, the clap, is a specific inflammation of the urethra, the result of contagion and very seldom innocently acquired. In the female it affects chiefly the vagina, and is much less serious or painful than in the male sex.

Symptoms.—The first symptom in the male is a slight uneasy sensation or tickling at the mouth of the urethra, which is generally felt between the second and seventh day after exposure to infection. On examination the organ is found slightly reddened, and the natural discharge of mucus a little increased, and more viscid than usual. These signs of irritation soon pass into those of inflammation, in which the redness, heat, pain and swelling, characterizing that process, are all experienced in an exaggerated form. The discharge becomes thick, yellow or greenish, and the pain on passing water, which must be done frequently, is very severe. Erections are frequent and painful. The penis is bent downward. These erections are called chordee. Swelling and inflammation of the glands in the groins, commonly called a bubo, is common, but the irritation seldom goes so far as to result in suppuration and abscess. Orchitis or inflammation of the testicle is more frequently observed. The disease is apt to last under the best treatment for a period of from four to six weeks, and if neglected or badly managed may be months before it is cured.

Treatment.—The most important part of the treatment is rest in bed, but as this can seldom be secured the inflamed parts should be supported by a suitable suspensory bandage. At first the treatment must be that of inflammation elsewhere, that is by saline purgatives, such as a tablespoonful of epsom salts, low diet, and half teaspoonful doses of sweet spirits of nitre or ten grains of Dover's powder to promote perspiration. Wrapping the affected parts in cloths soaked in a mixture of four ounces of lead-water and two grains of acetate of morphia, and covered with oiled-silk is useful, and the injection of dilute solutions of the same medicines, made by mixing an ounce of this liquid with three ounces of water may be cautiously tried, or a one per cent. solution of protargal. In the first few days irrigation with a one to five thousand solution of permanganate of potassium. The scalding on voiding urine may be mitigated by drinking freely of flaxseed tea containing two drachms of acetate or bicarbonate of potash to the pint, and a belladonna and opium suppository at night, repeated in two hours if needful, will generally prevent much trouble from chordee.

Diet.—The diet should be rice, bread with very little butter, milk, and, if necessary to keep up the strength, soft-boiled eggs. Meat, alcoholic and malt liquors, acids and condiments, are particularly objectionable.

Secondary Treatment.—After the first violence of the inflammation begins to subside the injections, such as silver nitrate, one grain to six ounces of water, or copper sulphate, one-half grain to the ounce, or acetate of lead and sulphate of zinc, each three grains to one ounce of water, may be made stronger gradually, allowing them to be of sufficient activity to produce a little smarting, lasting not longer than five minutes, each time they are used. They should be employed directly after each passage of urine, provided that does not occur oftener than once in two hours. At this period the administration of balsam of copaiba is usually commenced, and a good article of oil of sandal-wood appears to be even more efficient in checking the remaining discharge, two capsules of either remedy being taken four times daily.

Third Treatment.—In the course of another week injections of acetate of zinc, sulphate of copper or nitrate of silver, one or two grains to the ounce of water, may come into service with benefit, but great care must still be exercised in regard to errors in diet, a single glass of malt liquor being frequently sufficient to bring on a relapse. If neglected or badly treated the malady may run into the chronic form, which is called gleet, and often proves exceedingly rebellious to treatment. Five-grain doses of salol, ten drops each of tincture of chloride of iron with tincture of cantharides thrice daily often, however, succeed in bringing about a favorable change, and the introduction of a bougie smeared with belladonna ointment three times a week is apt to contribute to the cure.

STRICTURE OF THE URETHRA.

Causes.—Usually the attention is attracted by the circumstance that the desire to urinate becomes more frequent, and the force of the stream diminishes, so that the renal secretion dribbles away in drops, or runs off in a very fine stream not larger than a knitting-needle. There is more or less pain in passing water, and a good deal of straining is required to accomplish the operation, which begins to be dreaded from day to day, and even from hour to hour.

Treatment.—The treatment of stricture is purely surgical, as, being a mechanical obstruction, medicines can accomplish nothing for its relief. The usual method is by gradual dilatation, using first a small steel rod bent at the suitable curve and highly polished. This is to be warmed and thoroughly oiled, and then carefully passed into the bladder through the urethra, scarcely any force being employed. The great danger is that some of the inflamed and softened tissues in the neighborhood of the obstruction may give way, and what is called a false passage being formed, the condition of the patient is rendered far worse than before.

Using the Steel Rod.—The largest size that can be used successfully having been introduced, it is allowed to remain a few minutes and then an instrument of a little greater diameter is employed, and so on until the urethra, not without considerable suffering, is stretched to the original magnitude. In most instances, however, this dilating process must be kept up for months, the patient himself learning how to use the proper instrument, and introducing it at longer and longer intervals for a year or two until completely cured. Various other methods for relieving the obstruction of stricture have been devised, such as external incision, cauterization, and so forth.

Emergency Treatment.—In the emergency of an attack of retention of urine in a man who is the subject of stricture coming on whilst far from medical assistance, the first thing to do is to get into a warm bath, since this will often procure sufficient relaxation of the spasm, which always makes up part of the narrowing of an irritated stricture, to allow a little urine to dribble away, perhaps whilst bathing, and so relieve the distress of the patient. If this fails a laudanum and belladonna injection or suppository, or a full dose of twenty drops of laudanum, will frequently have the desired relaxing effect.

Self-Use of the Catheter.—Care should be taken to drink as little fluid as possible, so as to diminish the amount of the renal secretion to a minimum, until the avenue for its escape is again partially unclosed. If a catheter can be procured, the patient should try to pass it himself, choosing the time when he is still partly under the influence of the opium, which dulls the excessive sensibility of the urethra.

Substitute for Catheter.—In the absence of a catheter it has been most ingeniously suggested by Dr. Levis, of Philadelphia, to use a piece of bell-wire, doubled and bent to the right curve, along the sides of which, if safely introduced, enough urine might flow to relieve the over-distended bladder.

SYPHILIS.

A Punishment for Immorality.—This other form of punishment for immorality, even more far-reaching in its effects, since it often affects the unborn children of the offender, may be conveniently discussed in the present chapter.

Cause.—It is a disease the result of a specific poison produced solely by direct implantation of the contagious material, usually the purulent discharge from a venereal sore in a previously diseased person.

Development.—About a month after it is in any mode implanted in the human system it appears to begin a development throughout the whole organism, and penetrating to every part of the body, affects especially the skin, glands and throat in the form of secondary symptoms, and still later the cartilages and bones as tertiary manifestations, until finally, if unchecked, it often proves fatal, after intense and prolonged suffering.

Local Symptoms.—The first symptom of this horrible disease is usually a primary sore or chancre, which appears as a small pimple or blister upon some part of the organs of generation, or point of contact, any time within two or three weeks after the infection is received. The great distinction between the syphilitic ulcer, or true chancre, and the chancroid, or non-syphilitic sore, is that the former has a hardened base, but the most eminent surgeons admit that neither this nor any other criterion is infallible. The infecting pimple may dry up without ulcerating, but more commonly a cup-shaped sore from an eighth to three-eighths of an inch in diameter, and with raised edges, is formed, and unless modified by treatment lasts for a month or six weeks, when it heals up, leaving a hardened lump of a dark red coppery or bronze color. which is often several months in completely disappearing. The glands in the groins during the ulcerating stage of the primary chancre become swollen, hard and slightly painful, but seldom suppurate. After some weeks the other lymphatic glands partake of this enlargement, and gradually those in the armpit, in the neck and behind the ear give evidence of the general infection.

The Chancroid Sore.—The chancroid, soft-chancre or non-syphilitic sore, generally develops in a few days from the date of infection, first as a minute vesicle, then a pustule, and later as an ulcer, round or oval in shape, with clean-cut edges, and without any hardening of the base. The floor of the ulcer is generally covered with a thick yellowish matter, which is virulent and contagious in the highest degree. The glands in the groins are often not swollen, but if affected are much more apt to suppurate, constituting a bubo, the discharge from which is also intensely contagious. It is therefore far more troublesome than the primary syphilitic sore, and yet infinitely to be preferred to the latter on account of the absence of any constitutional infection.

The following is a diagnosis between chancre and chancroid:

CHANCRE.	CHANCROID.
1. Appears two to twenty days after exposure.	1. The interval between exposure and appearance is much shorter.
2. Is usually single.	2. May be multiple.
3. Inflammatory phenomena comparatively slight.	3. Inflammatory phenomena, heat, pain, redness and swelling very marked.
4. Discharge is serous or bloody and readily inoculable.	4. Discharge, profuse, purulent, very irritating and readily inoculable.
5. Margins of preputial orifice are not markedly inflamed.	
6. Marked induration.	5. Induration, if present, is not marked.
7. Buboes are invariably present, and in both groins; they rarely suppurate.	6. Buboes, if present, are usually on one side, and suppurative.

Constitutional Symptoms; Secondary.—After a true or hard chancre has developed, and no matter whether it has healed promptly or is still open, there appears in about four weeks, on an average, from the first infection the first of the train of general or constitutional symptoms. These consist of the tumefaction of the lymphatic glands, followed after a few weeks more by fever, headache, rheumatic pains and soreness of the throat. About the tenth week after the dearly-bought pleasure its unfortunate purchaser usually finds a crop of eruption appearing upon his skin, sometimes slight and easily concealed, but oftener well defined and in a tell-tale abundance, which instantly reveals his guilty secret.

The Eruptions.—This eruption may be of pimples, pustules, or scales, the former being the most common and having a new copper-colored red or brownish-red tint, which, when well marked, is to the experienced eye very characteristic. It is apt to be especially abundant round the sides of the nose and angles of the mouth and eyes, the roots of the hair on the forehead and back of the neck, the centre of the breast, the inner side of the limbs, and around the armpits and groins.

Hand and Feet Eruptions.—An important diagnostic mark of the scaly, syphilitic eruption is its appearance on the palms of the hands and the soles of the feet. These manifestations are also particularly liable to appear as pustules among the hair of the scalp. In some cases the whole body is thickly covered. After persisting for periods varying from two or three weeks to as many months, these spots usually fade, leaving behind them brownish stains which are very persistent, but ultimately may give place to pale scars, somewhat like the pitting of small-pox in a very mild form.

Other Appalling Symptoms.—In a minority of instances the patient escapes any well defined symptoms, but suffers instead from one of the following manifestations of secondary syphilis, which often accompany the eruptions also: Alopecia or falling of the hair, which in bad cases may include not only that of the head, but also the eyelashes and eyebrows; flat whitish sores in the mouth and anus, called mucous patches, the discharge from which in the former situation may easily convey, by kissing, the whole vile disease to a perfectly innocent person; inflammation of the iris injuring or even destroying the sight; and local diseases of the generative organs.

Tertiary Symptoms.—The late or tertiary symptoms of venereal disease are disease of the cartilages and small bones of the nose and throat, producing the shocking disfigurement of the countenance sometimes seen, especially among sailors; disease of the bones of the skull leading to persistent and excruciating headache, and sometimes actually perforating the cranium; disease of the tibia or large bone of the leg between the knee and ankle; disease of the nails which may entirely ulcerate out; disease of arteries which, of course, is most apt to prove fatal, and peculiar new growths called gummy tumors, which may appear in all parts of the system.

Congenital (Birth) Syphilis.—Congenital syphilis generally shows itself between the third and sixth week after birth, by cutaneous eruptions, similar to those seen in the secondary period of acquired syphilis, and of most frequent occurrence upon the buttocks, abdomen, palms and soles.

Symptoms.—Congestion and subacute inflammation of the mucous membrane of the nose, with increased discharge, vulgarly called the snuffles, also appear, and the infant has usually a peculiarly shriveled, weazened aspect, like that of a prematurely old man. Mucous patches from about the baby's mouth may infect the mother or nurse, and keratitis or inflammation of the cornea of the eye is lamentably common. Early and active administration of mercury is very important, lest the syphilitic cachexia prove fatal.

Local Treatment of Chancre.—The treatment of the primary sore, or chancre, is much disputed. Cauterization with nitric or chromic acid, or the acid nitrate of mercury, and subsequent dressing with black-wash—a mixture of a drachm of calomel, and a pint of lime-water—is much employed; but the application of iodoform is highly recommended. Complete excision of the sore, with its hardened base, in the hope of preventing secondary symptoms, has been tried without success, even when performed early. If the enlarged glands in the groins give rise to much discomfort, they should be painted over with the tincture of iodine or twenty per cent. ichthyol ointment.

Treatment by Caustic.—The prompt destruction of the chancroid ulcer by caustic, and the dressing with black-wash or yellow-wash, is advisable, and hope may be entertained of thus putting an end to the whole malady. If the glands in the groins go on to suppuration, however, very serious trouble may be anticipated before a cure is effected.

Constitutional Treatment.—The treatment of the secondary symptoms is by the use of mercury, which, although decried by some physicians, is considered by our best authorities as the only effectual remedy for syphilis. It may be administered by inunction of mercurial ointment, by fumigation, or in the form of half a grain of calomel, or blue pill, or one-third of a grain of the iodide of mercury thrice daily, or protiodide of mercury one-fourth grain three times a day. It is also given by hypodermic injections of the bichloride, one-third grain, once a week. The injection must be made deep into the muscles. Proper precautions must be taken to cleanse the needle and syringe before using, also the skin at point at which the needle must be inserted. This treatment should be kept up at intervals for a year or two after an apparent cure has been effected. To obtain its beneficial effects, which are often very marked and satisfactory, it is not necessary to induce severe salivation, which, probably, in former times, often aggravated the ultimate effects of the syphilitic poison.

Treatment of Third (Tertiary) Stage.—In the tertiary stage, iodine and iodide of potassium, in the form of the compound iodine solution, or the iodide occasionally in very large doses of fifteen or twenty grains, thrice daily, are the great remedies; but they may sometimes be associated with mercurials to much advantage. In a majority of instances, the development of well-marked tertiary symptoms may be prevented by judicious treatment in the second stage of the complaint, and even when a slight tendency to disease of the bones and cartilages is displayed, a combination of the iodides with mercury will often avert disastrous consequences.

Use of Tonics.—Throughout the whole management of the case the administration of tonics, such as iron, quinine and strychnia is very important, and strict attention to hygiene by promoting the best general health is an almost indispensable condition to securing a favorable result.

Should Syphilitics Marry?—Professor Alfred Fournier, in a late instructive work on syphilis and marriage, formulates some valuable conclusions in regard to the very difficult problem, from a hygienic point of view, whether a syphilitic person ought to marry or not. He asserts that a man who enters upon marriage, with syphilitic antecedents, may become dangerous: first, to his wife; second, to his children; third, to the interests of his family. In the first place the wife is apt to be infected directly by contact with the pus of secondary lesions; and Dr. F. says: "I know from long experience that it is rare to see a young wife live with a syphilitic man, or conversely, without the health of the former being effected by the diseased one." It was this which caused a witty French observer to say: "The pox is partaken of by a married couple equally, just like the daily bread."

Syphilis Conveyed by Conception.—Secondly, a man may convey syphilis to his wife by causing conception, as when a young girl, pure and healthy, is married to a man whose venereal disease has not been thoroughly cured. The physician calls a few months later and finds her diseased with, for example, distinct secondary symptoms, such as cutaneous syphilides, mucous patches in the mouth, scabs on the scalp, swelling of the glands in the neck, headache, vague pains, lassitude, febrile attacks, loss of hair, and so forth—all this without a trace of chancre, and even without that faithful companion of a chancre, a bubo, which M. Ricord calls so aptly the posthumous witness of a chancre. In these lamentable instances, the wife-mother, infected without having had any primary symptoms, and whose husband has long been freed from all external indications, is diseased, not from that husband, except indirectly, but from her child still within her womb.

Danger to Children.—As respects the danger to children: Although offspring may be begotten by a syphilitic father who enjoys good health, yet the hereditary influence of paternal syphilis is very far from being as innocent, minute or negative as has been maintained.

Development of the Inherited Tendency.—This inherited tendency may be developed in the three following modes: Either that, which is an exceptional case, by the transmission of syphilis to the fœtus; or that, which is sufficiently common, by the death of the child; or lastly, by the inherent degeneration of the germ, which ultimately reveals itself under a great variety of morbid conditions.

Worst Form of Danger.—But the worst form of danger to the family of a syphilitic father is that communicating the disease to the wife, the paternal and maternal influences will act upon the same side, and most disastrously conspire in unison against the fruit of any pregnancies which may result. In such sad cases we can predict that, with a few rare exceptions, either, first, the child will die before birth; or, second, it will be born with syphilis, and with all the possible and serious consequences of infantile syphilis, which in many cases are equivalent to death itself; or finally, third, it may be born without syphilis, but with uncertain health, with a weak nature and a feeble constitution, which will probably expose it to a rapid death; with menacing morbid tendencies; with a predisposition to certain organic diseases—in a word, to a relatively speedy decay; this terrible fate being visited again and again upon successive innocent babes.

Transmission of Syphilis.—At the New Orleans meeting of the Public Health Association, Dr. Gihon of the Navy, as chairman of a committee on the subject, presented a valuable report, in which he remarked: "Every one instinctively shrinks from the touch of the sufferer with small-pox, but how few realize that a syphilitic is a leper also to be most scrupulously shunned? How few mothers are aware of the danger, to themselves and their children, from nurses and housemaids drawn from a part of the population in which every fifteenth person is thus diseased? How few parents suspect the peril to their daughter from her accepted lover's kiss, since he may be that one in about every five young men among the better classes who has a venereal disease, which there is one chance in two is syphilis."

Transmission of Syphilis by Kissing.—These are not mere speculations, for Professor Gross reports that he has seen many cases communicated by kissing; and he tells of fifteen women, nine children, and ten men diseased by a single midwife, who had a chancre on her finger, contracted in the exercise of her profession, and who had thus carried the disease from house to house.

Transmission by Cooks and Nurses.—Dr. J. Marion Sims says: "I have seen a cook and a chambermaid with syphilitic ulcers on their fingers; I have seen nurses infected by the children they had nursed, who were born of syphilitic parents, in turn infecting sucking babes, born of healthy parents; and I have known a drunken vagabond husband to contract syphilis and communicate it to his wife, who in turn gave it unwittingly to her four children, simply by using the same towels and washbowl."

Transmission by Towels.—One of this very committee adds the case of an estimable and venerable lady, who lost her eyesight that year, from a venereal affection arising from using a towel in her son's room, carelessly left by him upon the rack; and of another, the wife of a clergyman, who the preceding summer sought relief at a Virginia spring for a horrible affection contracted in domestic contact with her servant.

Transmission by Pipes and Cigars.—The present Surgeon-General of the Navy saw a number of cases of chancre of the lips among the smokers of one set of cheroots, of which the wrappers had been moistened by the saliva of a Manilla cigar girl; and at Beyroot he learned that it was not unusual for syphilis to be contraced by using a *narghileh* that had been pressed by the lips of a diseased smoker. How many people would venture to eat Smyrna figs if they had seen the top layer of the choicest box pressed flat with the saliva-wetted thumb of the packer, who, there was one chance in ten, was a syphilitic?

Transmission by Exhalation.—A certain lady was terribly alarmed when told by her husband, a physician, that she had invited to her table a young man who, in the course of a physical examination that morning, he had found to have his mouth and tongue covered with mucous patches; and that her daughter was dancing in a public ball room with another whose body was repulsive with syphilitic eczema.

Transmission by Instruments.—An editorial in one of our Philadelphia medical journals not long since stated: "It has happened to the writer to be recently called to see a man of most respectable surroundings, who bore an unmistakable venereal sore upon his lip, and subsequently manifested all the features of secondary syphilis. It was said that this sore had followed a trifling surgical operation upon the part affected for the removal of a slight deformity, during which the instruments or the hands of the surgeon had inoculated him with syphilis.

Ever Present Dangers.—This energetic committee urged that it should be promulgated everywhere throughout the community, that so long as syphilitics are allowed to go unrestrained the spotless woman and the innocent child share the danger of this horrible contamination with the libertine and the courtesan.

The Various Ways of Transmitting Syphilis.—Let it be known by everyone, they exclaim, that this fearful pest may be communicated:

1. By the blankets of the sleeping car, the sheets, towels and napkins of the steamship, hotel and restaurant.

2. By the hired bathing dresses at a seaside resort, and the costumes rented for the fancy ball.

3. By the chipped edges of cups and plates, as seen at any hotel or eating house, and by the half-cleansed knives, forks and spoons of the same.

4. By public drinking vessels in a railway car or station, as well as the public urinal or water-closet.

5. By the barber's utensils, the comb and brush in the guest chamber, the hatter's measure, or the borrowed hat.

6. By the surgeon's and dentist's instruments, or the vaccinator's lancet.

7. By the broom or dust-brush handled by a parlor maid, or by the spoon or cup touched by the mouth of a cook or nurse.

8. By whistles and other toys sold to children in the streets by vendors with poisoned lips or fingers.

9. By playing or visiting cards which have been used, and especially by car tickets and paper money circulating in a city like Philadelphia, where 50,000 syphilitics are at large.

10. By the grasp of a friend's hand or the kiss of a betrothed lover, by the son to his mother and sister, the husband to his wife and unborn child, and by the latter to its mother.

SPERMATORRHEA OR INVOLUNTARY EMISSIONS.

Mental Anxiety.—As an appendix to the unsavory subjects discussed in this chapter a few remarks upon spermatorrhea and its usual cause are appropriate here. It would be impossible to estimate, with any approach to accuracy, the vast amount of anxiety and mental suffering needlessly endured in our community in regard to this disease. The lying advertisements of unprincipled charlatans are less openly displayed than formerly, and yet means are found with satanic ingenuity to reach their victims, and cruelly arouse, from mere mercenary motives, their liveliest apprehensions.

The Disease and Results.—That the disease called spermatorrhea exists, and in rare cases does result in the utter wreck of mind and body, which is painted by these designing quacks in such sombre colors, cannot be denied, but that nineteen out of every twenty young men who have become alarmed by the occasional or even frequent occurrence during sleep of what they have learned to control whilst awake, have no real ground for their agonizing fears is equally indisputable.

Causes.—The usual cause of spermatorrhea, of course, cannot be freely discussed in a popular work like this, and yet enough may be expressed in veiled language, the meaning of which will be only or chiefly comprehended by those who need the lessons inculcated, to accomplish, it is hoped, much good. Many young persons of both sexes, after being made aware of the danger in which they were becoming involved through evil examples, perhaps, of school associates, have earnestly tried to escape the thraldom of bad habits.

Treatment by Will Power.—Some of those who have succeeded, by the exercise of a resolution and strength of will, for which they deserve great credit, have overcome their enemy, but are yet haunted with the fear that they have been irreparably injured in the struggle. This fear is entirely unfounded, as time will infallibly prove.

Treatment by Exercise and Nutrition.—A second and larger class are still discouraged by frequently recurring evidence that they are not in a natural and healthy condition, and some may even be so disheartened as to feel almost hopeless. For such plenty of exercise in the open air, good nutritious food, chiefly vegetable, occupation of the mind in some study or suitable recreation, and the medical treatment of full doses of bromide of potassium every evening for a week, with or without a one-grain opium suppository at bedtime, can with a continued exercise of the will power during the waking hours speedily accomplish a cure.

Treatment by Hygiene and Medicine.—To a third class, who find themselves still unable to overcome temptation, much aid will be afforded by adopting the plan of hygienic and medical treatment above mapped out, and by diminishing, as the drugs mentioned can do, the force of the impulse itself, they may so reduce its power that a little additional resolution will suffice to achieve a victory. In this struggle they may find some support in the grand old maxim, "He that ruleth his own spirit is greater than he who taketh a city."

CURATIVE MEDICINE.

PART IX.

DISEASES PECULIAR TO WOMEN.

List of Diseases.—The diseases peculiar to the female sex comprise those of the uterus (womb), ovaries and their appendages, the vagina, external generative organs and mammary glands (breasts).

Divisions of Woman's Life.—The life of a woman may be devided into five periods. They are infancy, puberty, maturity, the menopause and senility.

Period of Puberty.—Puberty is the period in which the child becomes the woman, this is the period when she begins to menstruate. It is the time when the breasts begin to assume a rounded form, her general contour becomes shapened, and her generative organs have reached their full development. Maturity extends from puberty to the menopause, and is the period during which women bear children.

MENSTRUATION.

A Mother's Duty.—Menstruation or the monthly flow, is characterized by a bloody discharge from the womb, and occurs at regular periods, usually every twenty-eight to thirty days. It is the duty of every mother to explain to her female offspring this condition of affairs, detailing when it occurs, how often to expect it, and the use of the napkin during this period. Too many mothers, on account of a mock modesty, allow their children to pass through the establishment of this function in total ignorance. Such practice, however, should be condemned.

Beginning of Menstruation.—I have often seen children run to their mother when the first drop of blood appeared, frightened beyond description. The first flow usually appears between the ages of twelve to fourteen. In the torrid zone it appears two or three years earlier, thus these children are capable of child bearing at so early a period.

Frequency of Menstruation.—Every woman is a law unto herself. As before stated, menstruation usually appears every twenty-eight to thirty ys, some women, however, menstruate every four to six weeks and are in perfect health. A napkin should always be worn during the flow; surprising as it may seem, many fail to do so.

DISORDERS OF MENSTRUATION.

Suppressed Menstruation (Amenorrhea).—This is a term applied to the absence of menstruation, between puberty and the menopause.

Causes.—Pregnancy, and when nursing; anemia (impoverishment of the blood) is a very frequent cause; consumption, debilitating diseases, non-development of the generative organs; obesity and after the ovaries have been removed.

Symptoms.—Amenorrhea may come on suddenly or be of gradual development. The former variety is often the result of some violent excitement, fright or mental shock due to the setting in of some fever or other acute disease, or to that common and very dangerous cause, especially in young girls, imprudent exposure to cold or wet during the monthly flow.

Symptoms in Anemic Persons.—If due to anemia the patient has a pallor, and the margins of the lips will be pale, she will look "bleached out," shortness of breath, palpitation of the heart, swelling of the feet and ankles, headache and constipation.

Symptoms in Consumptives.—If due to consumption, cough and night sweats will be present, accompanied by marked emaciation (wasting away). When amenorrhea comes on gradually it is apt to indicate some serious chronic disease, which should be immediately investigated and attended to by a skillful physician.

Cessation of Menses.—When the cessation of the menses is part of such a severe malady as consumption or Bright's disease, it often appears to be only nature's method of economizing the failing strength of the invalid, so that any interference would be likely to prove positively hurtful. On the other hand, the natural reappearance of the menses after a stoppage in the course of a chronic malady may be welcomed as a favorable indication of a tendency toward improvement.

Symptoms Attending Stopped Menses.—The constitutional disturbance from abrupt suppression of the monthly flow is generally very great. There is usually severe pain in the region of the womb, similar in character to that of colic, and hysterical excitement, or even convulsions, and mania, may be the direct effect.

Treatment.—When due to anemia, iron is the best remedy, given in the form of Bland's pill, one four to five times a day. When taking iron it is always a good rule to take a dose of epsom salts once a week, in order to counteract the constipating effect of the drug. Other remedies are, a teaspoonful of the elixir of quinine, iron and strychnia, three to four times a day; the pill of the same ingredients, one four to five times a day; permanganate of potash, two grains three times a day; or the binoxide of manganese, ten grains three to four times a day.

When to Avoid Medicines.—The possibility that absence of the monthly period may be due to pregnancy should always be borne in mind, in which case it would be dangerous and criminal to administer any of the usual remedies for restoring the flow.

Treatment When Due to Cold.—When due to exposure to cold and wet resort to hot mustard foot baths or hip baths, mustard plasters to the inside of the thighs, calves of the legs and ankles. A hot sitz-bath is also worthy of trial. This consists of partially filling a "foot tub" with hot water, allowing the patient to sit in it, and covering her with a blanket. She should remain in the bath for five to ten minutes. The buttocks and thighs are then thoroughly dried, and she is put to bed. If constipated the bowels should be regulated. (See Constipation.) Vaginal injections of hot water are also to be employed. (See How to Use the Douche.)

Treatment of Young Girls.—The treatment of delayed menstruation in young girls who have passed the age of puberty must be on general principles adapted to improving the general health, unless there are signs of the menstrual blood being retained inside the womb, a dangerous condition which should always be considered in such instances and relieved as early as possible by a surgical operation.

PAINFUL MENSTRUATION (DYSMENORRHEA).

Meaning of the Disease.—By this is meant painful menstruation. The pain may occur before, during or after the flow. Many varieties have been described, such as the obstructive, congestive, mechanical, neuralgic, and so forth, but it is very difficult at times to differentiate them.

Causes.—Usually due to the womb being out of its normal position, tumors, and inflammatory diseases of the womb and ovaries.

Symptoms.—A woman who enjoys health not only menstruates regularly, but does so with perfect freedom from suffering, but unfortunately there are very few members of the female sex who pass through the whole period of their sexual vigor without being called upon to endure more or less frequently attacks of dysmenorrhea.

Pain With the Flow.—Some women experience great pain with each flow, from the commencement of puberty, every month, until the change of life relieves them. With the majority, however, pain is only the exceptional accompaniment. With some women marriage effects a cure, whilst in others, especially when there is sterility, it either aggravates or originates the dysmenorrhea. Under no circumstance, however, would a physician advise a woman suffering with dysmenorrhea to be married in the blind hopes that it would effect a cure.

Bearing-Down Pains.—Bearing-down pains, not severe, are often present; accompanied by a sensation of weight. The pains as a rule are cramp-like, and intermittent, varying in severity. At times the pains are followed by the expulsion of blood clots which oftentimes affords relief. Severe pains as a rule necessitate the sufferer going to bed, where she may have to remain for several hours to a day or two. As a rule constipation is present, again diarrhœa may be troublesome.

Nausea.—Nausea followed by vomiting adds to the severity of the attack. Headache is invariably present. The pains may extend from the lower part of the abdomen down both legs. Pain in the back is oftentimes quite marked, the sensation being that of the back splitting open.

Treatment.—The existence of dysmenorrhea depends upon so many conditions that the treatment employed in one case will seldom relieve the next. During the attack of pain, the patient should take a hot sitz-bath, and if the suffering is very severe, may have a suppository of half a grain of opium combined with a quarter of a grain of belladona. Under no consideration should a hypodermic injection of morphine be given, without a physician's advice. Again, a sitz-bath may be given, followed by a turpentine stupe, and ten grains of Dover's powder. Tincture of belladonna five drops every three hours may be given; or the following: antipyrine five grains every hour until four doses are taken, then every three hours until relieved; acetanilid five grains in the same manner; tincture of gelsemium ten drops every three hours; bromide of soda or potassium twenty to thirty grains every three hours; or as a final resort, if the above-named remedies fail to afford relief, morphine, either by the mouth or a hypodermatic injection, but only on the advice of a physician. Hot vaginal injections should also be tried, using at least a gallon of water.

Purgation.—Often when the attack is accompanied by constipation, a purgative dose of epsom salts or aloes will be of service.

Attention to the General Health.—Between the attacks attend to the general health. Employ the tonics mentioned in the treatment of amenorrhœa. Take plenty of out-of-door exercise. Avoid undue excitement, straining or heavy lifting, the bicycle and dancing, as the time for the flow approaches.

Prevention of the Pain.—An endeavor should be made to prevent the pain if possible. The best drug for this purpose is tincture of gelsemium, five drops after meals, to begin ten days before the flow is expected. This is to be continued until the flow is well established, then cease until within ten days of the next period. It will prove advantageous at times to combine with the gelsemium five drops of the tincture of cannabis indica.

When Drugs Fail.—If drugs fail to afford relief, then it may be neccessary to dilate and curet (scrape) the womb, an operation which, when properly performed, will give excellent results. This operation will only keep the patient in bed ten days, and at the end of the second week, she will be able to resume her routine duties.

EXCESSIVE MENSTRUATION (Menorrhagia and Metrorrhagia).

Meaning of the Disease.—When the monthly flow persists longer than usual or is excessive in amount it is called menorrhagia. When there is a bloody discharge from the womb between the monthly periods it is termed metrorrhagia.

Causes.—Both may be due to obstruction of the general circulation of the blood, from disease of the heart, lungs and liver. Tumors of the womb, inflammatory disease of the womb, ovaries and tubes. The more frequent causes are, getting out of bed too soon after confinement, retained portions of conception, due to improper care during a miscarriage (see Miscarriage), polypus tumors of the womb and cancer.

Symptoms.—Anyone suffering from either of these conditions should be examined by a physician in order that he may ascertain the exact cause and remove it; otherwise delay due to home treatment, should the cause be a dangerous one, may prove fatal. In a woman otherwise having a normal flow, she will notice that the flow lasts a day or two longer, or may be excessive in amount, requiring a greater number of napkins than usual.

Excessive Flow.—The flow may be so excessive as to require rest in bed. When a large amount of blood is lost there will be pallor of the skin, dizziness, headache, extreme prostration, specks will appear before the eyes, she may feel as though she was falling through the bed. Or again, if the condition present is a metrorrhagia, there will be a discharge of blood between the periods, which discharge if it becomes excessive will give rise to the same symptoms just mentioned.

Treatment.—In the treatment of menorrhagia there are two indications to be fulfilled, first to check the present hemorrhage; and, second, to remove the cause upon which it depends, and so obviate the certainty of its recurrence. To accomplish the first of these desirable objects, which should not, however, be attempted in any monthly period, until the usual amount of blood has been eliminated from the system, say until the second or third day of the flow, try half a teaspoonful of ergot every three hours. Rest in bed is, however, an important part of the treatment, without which all the good accomplished by skillful medical care may be speedily dissipated. Other remedies are, half a teaspoonful of hydrastis canadensis every three hours; half a teaspoonful of witch hazel every three hours; gallic acid, 5 grains every four hours. A very good prescription for bleedings of this kind is as follows:

℞.—Ext. hydrastis fluid (colorless)	1 ounce
Ext. ergot fluid	½ ounce
Ext. hamamelis fluid	1 ounce
Aqua, q. s.	3 ounces

M.

Sig. One teaspoonful every three hours.

Plugging the Vagina.—If these remedies fail and the case is an urgent one, it will be necessary to tampon or plug up the vagina with pieces of raw cotton, lamb's wool, or linen cloth, taking care not to employ an undue amount of force in introducing these materials. They should have a string securely attached to them in order to facilitate their removal. In no case should such a plug or tampon be allowed to remain longer than twenty-four to thirty-six hours, for fear of poisoning the system with the putrifying blood entangled in it. When the tampon has been removed, if the bleeeding is not checked, tampon again.

Removal of Tumors.—If the bleeding is due to the presence of tumors, it will be necessary to have them removed.

Further Treatment.—Frequently medicines and tampons fail to control the hemorrhages, especially when there is proud flesh in the womb, and when the muscles of the womb are unable to contract. In such an event the only procedure is to dilate and curet the womb, which operation will remove the source of the trouble. In some cases of dysmenorrhea enlargement and congestion of the ovaries appear to be the important factors in the production of the malady. Such attacks are apt to be very intractable, unless the disordered condition of the ovaries are remedied, usually by an operation.

LEUCORRHEA OR WHITES.

Character of Whites.—This prevalent, troublesome and disagreeable condition, vulgarly termed the "whites," consists of a discharge of mucus or muco-pus from the womb, neck of the womb and vagina. It is very similar to that occurring from the nose during a cold in the head. In fact, the condition of the mucous membrane giving rise to leucorrhea is often one of catarrhal inflammation.

Causes.—It may be brought on by taking cold; by local excitement; by inflammation of the neck of the womb, the womb proper or the lining membrane of the womb; oftentimes the trouble is localized in the mucous membrane of the vagina; disease of the ovaries and tubes may also be at fault. It is frequently due to a "run down" system, yet women in perfect health may be affected; in the latter class it is probably nature's method of overcoming an excess in the richness of the blood.

Character of the Discharge.—The character of the discharge varies; it may be thick and tenacious, or it may be liquid, when it will run down the limbs in a stream and greatly soil the clothing. As ordinarily seen, it is not usually accompanied with much pain, but when very profuse, distress in the back and a dragging sensation in the lower part of the pelvis, often described as a bearing down feeling, are the symptoms most frequently observed. The discharge is generally more abundant a little while before, and for two or three days after the occurrence of the flow. In fact, when the leucorrhea is severe, this increase of the flow of whitish matter sometimes continues for a couple of weeks after the monthly period with increased violence, showing how greatly it depends upon a congestion of the parts concerned for its production.

Treatment.—The treatment of this rather intractable malady, besides the necessary attention to the general health, by the use of tonics and nourishing food, consists of the employment of astringent injections into the vagina. For building up the health the following pill will be found of service:

℞.—Acidi arseniosi (arsenious acid)	1 grain
Ferri reducti (reduced iron)	5 grains
Quinia sulph. (quinine)	20 "

M. Fiat in pil. No. XX. Sig.—One pill after each meal and at bed-time.

Additional Treatment.—If the leucorrhea is due to irritation of the ovaries, apply a cantharidal plaster over the groin on both sides. The best results, however, are attained by the employment of vaginal injections, such as a teaspoonful of creolin to two quarts of hot water; twenty grains of sulphate of zinc, or ten grains of sulphate of copper in the same quantity of water; thirty grains of alum to the pint; and a teaspoonful of lysol to two quarts of water are all worthy of a trial. A very cheap injection is made by adding one ounce of powdered oak bark to each pint of water, or one ounce each of tannic acid and glycerine to two quarts of water.

Treatment for Fetid Discharge.—When the discharge is fetid, permanganate of potassium should be used one-half drachm to one pint of water. This solution will stain linen, so be careful to avoid splashing it over the douche pan. (See How to Use the Douche.) Another very good drug to eradicate the odor of this discharge is bichloride of mercury. The druggists dispense a tablet containing seven and seven-tenth grains of the drug. One of these tablets added to two quarts of water makes a solution the strength of which is 1-4000. Such a solution should be used two or three times a day. All the injections above mentioned can be used night and morning, but if the discharge is profuse, three times a day will not be too often.

An Injection for Whites.—A very useful astringent injection for leucorrhea, whatever may be its cause, may be made by ordering:

℞.—Zinc sulphat (sulphate of zinc)	1 drachm
Alumin sulph. (sulphate alum)	1 "
Glycerine	6 ounces

Sig.—A tablespoonful to each quart of water.

This injection can be used night and morning.

Local Applications.—When the leucorrhea is caused by catarrhal inflammation of the cavity of the womb, as is frequently the case, injections into the vagina are, of course, almost worthless, and local applications made by a physician are very important, and should be faithfully persevered in, sometimes for many months.

HOW TO USE THE DOUCHE OR VAGINAL INJECTION.

Varieties of Syringes.—Before proceeding further let me describe the proper manner of taking a douche. First the varieties of syringes. These are numerous, but for practical purposes there are only two which are used to any extent. They are the Davidson, or bulb syringe, and the Fountain syringe.

The Bulb Syringe.—The bulb syringe is not to be recommended, because it is dirty, a great deal of muscular energy is required to work it, hence is tiresome and necessitates too much preparation for its use. It is very difficult to employ this syringe while lying down, and this is the only position in which a douche should be taken.

Using the Bulb Syringe.—In using this kind of a syringe generally a pint of the solution is placed in a basin over which the woman squats, and by squeezing the bulb forces the liquid into the vagina as fast as it runs out, thereby filling the syringe joints with the vaginal secretions, and returning to the vagina as soon as they flow away the impurities which have left it. If, however, a woman prefers this kind of a syringe, and insists on sitting over a bucket or other receptacle, then the solution should be placed in one basin, and that which is forced into the vagina permitted to run into the vessel upon which she is sitting.

Object of Using the Syringe.—The object of using the syringe is to bathe the vagina and neck of the womb. By sitting on a vessel the latter is prevented, for just as soon as a woman sits down, then the vagina is doubled on itself in such a manner as to prevent the solutions reaching the womb.

The Fountain Syringe.—The Fountain syringe is to be advocated, not only for this purpose, but for all-round family use. This syringe consists of a bag of soft rubber with a long rubber tube and a series of hard rubber nozzles. The largest size is intended for the vagina. The "Alpha" is the best, because it has a valve at the opening which prevents the solution from running out at the top. This is a great advantage because the bag can be laid on the floor, a shelf or anywhere without spilling its contents.

Proper Way to Take Vaginal Injections.—The proper way to take a vaginal injection is as follows: First fill the douche bag, which should hold at least two or four quarts, with the solution which is to be used. Hang it on a nail, which should be driven near the bed. Then place the douche pan on the bed. A good douche pan should be large and capable of holding at least one to two gallons. They are made of tin and agateware. Then lie down in bed, placing the douche pan under you in such a position that the buttocks rest on the top of the pan, in order that the solution after leaving the vagina will run directly into the pan without splashing over.

Improper Positions in Douching.—This is the correct way to take a douche. The other methods of sitting over a basin, or standing over a vessel, are to be condemned. This is the only way in which the womb can be bathed with the solution used, and not less than one to two quarts should be employed when a drug has been added; and when plain hot water is used, four to six quarts will not be too many.

Temperature of Douches.—All vaginal douches should be as hot as the patient can stand, and under no circumstances should cold water be used, as it is injurious. In exceptional cases hot water increases the pain instead of relieving it, and is then advantageously replaced by lukewarm water.

What Women Should Avoid.—Under no condition should a woman endeavor to introduce the small nozzle into the womb, or endeavor to force a solution of any kind into the womb. This is an exceedingly dangerous practice, and many a woman by so doing has sown the seed of pelvic inflammation, which has only been relieved by the removal of both ovaries, and in some cases the womb.

CONSTIPATION.

Woman a Constipated Animal.—The eminent Dr. Goodell once said: "Woman is a constipated animal." While we do not desire to class the gentler sex as an animal, still this statement contains a great deal of truth, for, by far the greater majority of women are constipated.

Causes.—This troublesome state can be attributed to a number of causes, the most frequent of which is leading a sedentary life; omitting daily exercise, which tends to excite the secretions of the bowels and liver to their proper activity. Another very frequent cause is laziness pure and simple, the patient failing to go to stool when informed by nature that such should occur.

A Very Frequent Cause.—Modesty is a very frequent cause of constipation in women, because a woman prefers to suffer rather than to go to a closet which may be somewhat publicly situated. Heredity, muscular weakness, hepatic torpor, lack of secretions in the lower bowel, backward displacement of the womb and lacerations of the perineum are frequent causes of constipation.

Symptoms.—General weakness, a feeling of languor and mental depressions are frequent symptoms; nervousness, headache, loss of appetite and a furred tongue may also occur. Individuals differ in this matter, one feels wretched all day without the accustomed evacuation, another is comfortable all the week except on the day which, by purge or enema, the bowels are relieved.

More Serious Symptoms.—When persistent the accumulation of the feces leads to serious symptoms, such as ulceration of the colon, peforation of the bowel, piles and inflammation of the bowels. The bowel contents may become dry and hard, forming large masses, which can only be removed by a physician with a great deal of difficulty.

Nausea.—In women who have been habitually constipated, attacks of diarrhœa with nausea and vomiting should excite suspicion, and lead to a thorough examination of the lower bowel.

Poisoning.—Part of the bowel contents may be absorbed by the system, giving rise to a general poisoning, which will recur at stated periods, until the constipation is cured. Costiveness is the recognized cause not only of hemorrhoids, of pelvic congestion, of inflammation of the womb and of disorders of the digestive apparatus, but also of the fecal poisoning just mentioned. For if diseases breed from bad drainage without the body, how much more from bad drainage and defective sewerage within the body! Feeble mothers beget feeble children—children who are carried from the womb to the grave, or who peak and pine under the heritage of ill health.

Other Causes.—Such then being the condition of the majority of American women, what is the cause? Probably no single cause has had so much influence in producing the peculiarly delicate condition for which women living in the country and in small towns in America are notorious, as the discomfort, inconvenience, and frequent repulsiveness, and, I may add, indecent exposure, of their closet accommodations.

Insufficiency of Closet.—In the teeming tenement house of any of our large cities there is usually but one closet, and that is invariably a cesspool, wet and foul, reeking with filth, poisoned by noisome stenches, defiled by lewd couplets or by obscene cuts, indecent from thin partitions and wide chinks, or from being preoccupied by one of the opposite sex. Under such conditions what woman can avoid schooling herself into the habit of resisting the evacuation of her bowels?

Inconvenient Privies.—In the small houses of tradesmen and of mechanics the water closet is rarely to be found, nor are the houses of the better classes always supplied with this luxury. The privy is then usually placed at the farther end of the yard, and approached by a long and unsheltered path. It is, therefore, almost inaccessible in bad weather or on dark nights, and is overlooked by the backbuildings of all the neighboring houses.

Risk to Women.—To a delicate woman the exposure to the weather is a serious risk; to one who is menstruating it is a constant menace; while to the refined woman the exposure to view compels the postponement of her physical duties to nightfall, or until driven to them by a sheer necessity which knows no law.

Country Closets.—Nor does the condition of the closets in the country present a more agreeable contrast. In many parts of the Southern and Western States a clump of bushes, the shelter of a rock, the nearest grove affords the only accommodations. But take the most thickly settled States, where is the small farm house whose privy invites rather than repels an operation of the bowels?

Privy a Misnomer.—The very name of privy is a misnomer. How seldom is the building hidden by clumps of evergreen, or a screen of lattice work. How often is it not an embarrassing distance from the house, at the end of a long trail, or, at least, of a long unkept path, which frequently runs parallel with a street or with a road.

The Outlandish Privy.—Where in the country, and for that matter in cities also, is not to be found the privy made up of rough boards rudely spiked together, with cracks wide enough to spoil all privacy, with a door without a bolt, and generally hanging by one hinge, with a crescent shaped hole for a window, and with its sole object of furniture a barrel of rasping corncobs? When is it ever sheltered from the rude blasts of winter, or not poisoned by noisome stenches, acrid vapors and unclean flies? After such an unsightly but truthful picture, can we wonder that the calls of nature are looked upon as grievous dispensations of Providence, as hateful duties which are to be put off as long as possible and obeyed as seldom as necessary?

Repellant Conditions.—Imagine now broad daylight, with its busy traffic, a rainy or a dark night, the grass wet with dew, or the ground covered with snow, or the temperature, perchance, many degrees below zero. Under such circumstances what woman can respond to the calls of nature without putting herself to great discomfort, to great risk, indeed, if she be menstruating, or without blunting the edge of her womanly sense of decorum.

The Antidote.—I have told you the bane; now what is the antidote? Clearly such closets as a civilized Christian people—a people living in the twentieth century are not degraded in using; closets that are decent, comfortable and accessible; closets that invite rather than repel those in which an operation of the bowels is not tantamount to being buffeted by satan for a season.

Country Earth Closets.—In cities, and in towns which are supplied with water works and good drains, the use of the water closet ought to become universal. In the country, where such a luxury can be attained by the rich alone, the earth closet is the only substitute; I cannot too strongly urge its adoption.

Treatment.—Much may be done by systematic habits. Set a certain time of the day, and at that time go to the closet and endeavor to have an evacuation Continue with this each day, and permit nothing to interfere with this duty at that particular time. The desire to go to stool should always be granted; when there is a desire, go by all means.

Treatment of Stout Women.—In stout women with flabby abdomens the muscles should have the support of a bandage. Exercise is of great value; by far the best being horseback riding at least an hour a day, or every other day. Massaging the abdominal muscles is also of value. Much good can be accomplished by the daily use of the "home gymnasium," or dumb bells and Indian clubs.

Diet.—The diet should also be regulated. Very often if a plateful of cracked wheat is used at breakfast each morning, and bran bread taken in addition, a chronic tendency to constipation can be removed. Milk is not to be recommended. Green or canned corn is of great service. Fruits also do good. Nothing is so good as a glass of cold water taken on arising in the morning just before breakfast; or if the cold cannot be borne, then a glass of as hot water as can be swallowed may be substituted. It must be remembered that strawberries, raspberries and blackberries are constipating rather than purgative. Coffee has a binding effect on some persons; brandy is distinctly constipating, whereas whiskey has no influence one way or the other.

Treatment by Medicines.—The use of drugs for the relief of constipation consists in those that unload the bowel, which has become filled, and those which will cure the tendency. Let us consider the first variety. For this purpose may be mentioned epsom salts, half to one tablespoonful, preferably taken in the morning on an empty stomach; mercury, in the form of calomel, one-fifth of a grain every hour until about ten doses are taken, then following with a bottle of citrate of magnesia; castor oil, half to one tablespoonful, or twenty grains of powdered rhubarb at bedtime.

To Cure Tendency.—Of the second class, half to one teaspoonful of the fluid extract of cascara sagrada at bedtime; fluid extract of liquorice in the same manner; or a dessertspoonful of phosphate of soda in one-quarter of a glass of hot water before breakfast. Rhubarb is not to be recommended for constant use, as it is astringent, and after the bowels have moved the constipation will be more pronounced than before. Mercury is exceedingly harmful if used continuously as a purge, and is the cause of much ill health, bad teeth, and digestive troubles. Castor oil is notorious for its tendency to ultimate constipation.

Very Best Drugs.—Of the curative class of drugs none compare to cascara sagrada, which should be used in the form of the tasteless fluid extract, or cascara cordial. This is the only drug which moves the bowels and at the same time tends to make the future movements more easy and regular; the dose is ten to twenty drops of the fluid extract every night at bedtime, or one to six teaspoonfuls of the cordial. If the fluid extract, in the doses above mentioned, fails to act, increase the quantity each night until at least a teaspoonful is necessary.

The following two prescriptions will be of value:

Aloes	20	grains
Extract of nux vomica	4	"
Extract of physostigma	3	"
Extract of belladonna	4	"

Make into twenty pills. Take one pill at night or one night and morning.

Or

Resin of podophyllum	2	grains
Extract of nux vomica	4	"
Extract of physostigma	3	"
Extract of belladonna	4	"

Make into twenty pills. Take one at night or night and morning.

Injections.—The employment of enemas, or injections, as a routine practice is to be discouraged. In cases where it is neccesary to use them for temporary relief, and to get rid of the gas, a little soap, common salt, and a few drops of turpentine may be added to the water.

DISEASES OF THE EXTERNAL GENITAL ORGANS.

Vulvitis.—This is an inflammation of the vulva, the part so often referred to by women as their "person" or "privates." It is divided into several different varieties, which can only be distinguished by a physician.

Causes.—One of the most frequent is lack of cleanliness; irritating discharges from the vagina and womb, which trickle over the parts; tight fitting drawers, which rub and chafe; injuries, as striking against a chair, or falling on an object; self abuse; excessive or brutal intercourse; pregnancy; fevers; may follow a long and difficult labor; and is apt to occur during an attack of diabetes.

Symptoms.—General discomfort, sensations of burning which amount at times to severe pain; burning pain during urination; the parts are usually swollen and very red. In diabetic vulvitis the itching is intense, and oftentimes is the first symptom of diabetes. Every woman who passes large quantities of water and suffers from intense itching of these parts should have her urine analyzed to see if it is due to diabetes. Owing to the fever and swelling the parts at first are dry, due to the lack of secretion; but as this increases the parts become raw and very painful.

Treatment.—Cleanliness is the first consideration. Warm sitz-baths, hot vaginal injections of plain water, or water to which has been added creolin one-half a teaspoonful to two quarts, borax a teaspoonful to the quart, or a dessertspoonful of salt to the quart. Use these several times a day. After thoroughly cleansing the parts, they may be dusted with talcum powder, starch, or starch and bismuth, equal quantities, bismuth or borax.

Checking the Beginning.—Oftentimes the attack can be checked at the beginning by applications of lead-water and laudanum. The best way to apply this is to soak a piece of absorbent cotton, about the size of the hand, with it, and place it in between the legs.

Treatment by Injection.—If the irritation is due to worms, a rectal injection will usually remove them. If the itching is very severe try hot vaginal injections of bichloride of mercury, seven grains to the quart; salicylic acid the same strength; or a solution of hyposulphite of soda, one ounce to the pint of water. After the parts have been dried any of the following will be found beneficial: benzoated zinc ointment; iodoform ointment; solution of carbolic acid, half a teaspoonful to a cup of water; nitrate of silver, eight grains to the ounce of distilled water, and painted over the parts oftentimes affords the greatest relief. The bowels should be kept freely open.

PRURITUS (ITCHING OF) VULVA.

Definition.—By pruritus is meant itching; the privates are the one part of a woman most frequently affected with this troublesome condition. Pruritus is not a disease, but a symptom of other conditions.

Causes.—It is of frequent occurrence during pregnancy, and very often the result of uncleanliness; is invariably caused by irritating discharges from the vagina; may be associated with tumors of the parts, and is often present during the course of diabetes.

Symptoms.—Intense itching, the woman is almost driven to desperation, and scratches the parts until they bleed. The itching is usually aggravated by walking or becoming warm in bed. This condition may be so marked as to lead to melancholia. The intense suffering causes loss of sleep, exhaustion, and sometimes alarming nervous depression. The more the patient is compelled to scratch, the more the parts are irritated.

Treatment.—Remove the cause if it can be found. In order to remove irritating discharges sitz-baths and vaginal douches, as described in the treatment of vaginitis, are used. After thorough cleansing of the parts they may be dusted with calomel, bismuth, starch or lycopodium powder. The calomel is generally preferred. Before applying the powder first dry the parts. Great relief is sometimes experienced from a gauze ompress over the vulva, saturated with a solution of lead-water and laudanum, equal parts. This dressing should be frequently changed.

Auxiliary Treatment.—The intense itching which appears at night after retiring can often be prevented by applying to the vulva cloths wrung out in hot water. Ointments are useful from their soothing effects and, in addition, they protect the parts from the irritating discharges. These are iodoform ointment, sulphur ointment and zinc ointment.

HEMATOMA (BLEEDING) OF THE VULVA.

This term is applied to any hemorrhage which may occur in the tissues of the privates. It usually occurs on one side, rarely on both.

Causes.—The most frequent are falling on a sharp substance; very often while housecleaning a woman will stand on a chair which, should it slip, may cause her to fall in such a manner as to straddle the back of it; the insane may self-inflict wounds in this spot. Among other causes are intercourse, pregnancy, tumors and diseases of the blood-vessels supplying the affected parts.

Symptoms.—The symptoms are practically those of injury to any other part of the body. The bleeding may be very profuse, especially if there is a cut. If the parts are only bruised the bleeding will be more or less extensive, the blood simply pouring out into the tissues, causing a swelling of the parts. There will be pain of a sharp or tearing nature, which may be accompanied by faintness. If the swelling is large, it may press on the urethra, and cause difficulty in passing water.

Treatment.—The bleeding may be controlled by the application of ice or by using pressure or both. Simply take a clean napkin and hold it tightly against the injured parts. After the blood has been in the tissues for a few hours a hard blood-clot forms. If this is not absorbed within a few days the part should be lanced and the clot turned out. If the swelling is small, lead-water and laudanum applied to the parts on pieces of gauze may cause it to disappear.

TUMORS OF THE VULVA.

The vulva, like any other portion of the body, is subject to the occurrence of tumors which may or may not be malignant. If such a tumor growth should occur a physician should be consulted, in order that he may diagnose its exact nature and institute the proper treatment. Too often innocent looking growths have been allowed to go unattended, which, when too late, have been found to be cancers.

SKIN DISEASES OF THE VULVA.

The skin of the vulva may be affected with various skin diseases, as eczema, erythema, acne, herpes, prurigo, scabies, pediculi and erysipelas.

Causes.—The various diseases are due to irritating discharges from the vagina or womb, menopause, vesico-vaginal fistula, indigestion, diabetes, and in stout persons during exceedingly hot weather.

Scabies.—Scabies is due to the parasite acarus scabiei. This parasite may spread from some other part of the body. This itch-mite burrows into the skin and gives rise to intense itching, which increases when the body is warm. It is usually due to uncleanliness and coming in contact with uncleanly persons similarly affected.

Crabs.—Pediculi are often found about the external genitals. This is also a parasite, commonly called "the crabs." These parasites localize themselves in the hair, and can be seen clinging to it. They are generally contracted through intercourse with indecent women. Too often husbands thus affected bring them home and innocently cause a similar condition with their wives.

Treatment.—Hot vaginal injections, as advised for diseases of the vagina. Local soothing applications should be made, such as bismuth powder, ten per cent. solution of carbolic acid, benzoated zinc oxide ointment three to four times a day; powdered zinc oxide three to four times a day; acetanilid and chalk equal quantities, three to four times a day; carbolized zinc ointment three times a day, and lycopodium powder several times daily. If scabs are present wash them off with almond or other bland soap, after which apply any of the above ointments. Keep the bowels open daily, resorting to the treatment as advised for constipation.

Accessory Treatment.—If scabies are the cause take a warm bath with free use of soap, followed by dusting the parts with sulphur. Sulphur ointment has been highly recommended.

If due to pediculi, the best treatment is to shave the hair and thoroughly rub in a ten per cent. ointment of oleate of mercury three times a day, or blue ointment four times a day; bichloride of mercury, five grains to a pint of water, bathing the parts several times daily; or carbolic acid solution several times daily.

VAGINISMUS, OR CONTRACTION OF VAGINA.

Vaginismus is a painful spasmodic contraction of the vagina which more or less prevents intercourse.

Causes.—Very frequently due to an extremely sensitive condition of the remnants of the hymen, which will produce violent contraction of the muscles of the vagina. It may also be caused by a fissure of the vagina, erosions of the parts, fissures of the anus and an urethral carbuncle.

Treatment.—If due to a carbuncle it should be taken out, which operation will confine the woman to bed for five to seven days. When due to a thick hymen it will need the attention of a physician. Among the remedies which may be tried at home are injections of a teaspoonful of laudanum to a pint of hot water; an ointment of iodoform; or fifteen to twenty grains of bromide of sodium three to four times a day.

COCCYGODYNIA.

It consists of a very painful condition of the muscles at the very tip of the spine. Is most common in women who have borne children.

Causes.—Injuries during childbirth, blows and falls striking the tip of the spine, cold or exposure of the buttocks, and uterine or ovarian diseases.

Symptoms.—Severe pains in the region of the tip of the spine, increased by motion.

Treatment.—During the acute attacks it may be necessary for a physician to administer hypodermic injections of morphine to relieve the pain. As a rule an operation will be the only treatment to render a complete cure.

URETHRAL CARBUNCLE.

This is a small raspberry-like growth which is very sensitive, and to be found at the mouth of the urethra.

Causes.—These are uncertain. No definite cause has as yet been decided upon.

Symptoms.—It gives rise to severe itching and pain. During urination, as the water runs over it, the pain is more or less excruciating, so marked that women will oftentimes withhold from passing their water until they are further unable to withstand the calls of nature.

Treatment.—An operation is imperative, as no other treatment will afford relief.

DISEASES OF THE VAGINA.

ATRESIA OF THE VAGINA.

Causes.—This means an absence of the vagina, or a closure of it. The child may be born this way, in which case it is due to improper development in the womb. Or, as is more frequently the case, it is acquired, due to caustic remedies carelessly applied, a long and tedious labor, extensive ulcerations, and a hymen which does not have an opening.

Symptoms.—In children born with this deformity it is often not noticed until puberty, when the child should menstruate. In fact, menstruation does occur, but owing to the absence of the opening in the hymen it is prevented from escaping and accumulates in the womb. Each month menstrual pains will recur, but there will be a failure of the blood to escape.

Treatment.—This is purely operative.

VAGINITIS.

Vaginitis is an inflammation of the vagina.

Causes.—A rundown system, anemia, systemic conditions producing congestion of the pelvis, such as pregnancy and tumors. May be due to friction produced by a badly fitting pessary, to irritating discharges from the womb, to excessive coition.

Symptoms.—Feeling of heat in the vagina; pain in the pelvis; at times a frequent desire to pass water; itching and burning about the entrance to the vagina; backache; loss of appetite and at times nausea.

Treatment.—When the inflammation is acute keep quiet, not necessarily in bed. Keep the bowels open, and give a light diet, no meat. If there is much pain use a five-grain opium suppository. If the itching is severe take frequent warm sitz-baths and vaginal douches of hot water containing either of the following: Borax one teaspoonful to the pint, sugar of lead water one teaspoonful to the pint, or half a teaspoonful of creolin to two quarts. These injections should be used several times daily.

MALIGNANT TUMORS OF THE VAGINA.

The vagina may be the seat of cancer. It may begin here, or spread to this canal from the bladder, rectum or womb.

Symptoms.—Cancer usually appears from thirty to forty-five years. The important symptoms are hemorrhage, which often follows straining at stool, or after coition; a foul discharge, which is very repulsive; it may be thick, but as a rule is watery; pain, this is always present, but not, as a rule, until after the disease is well developed.

Treatment.—The diseased tissue should be removed, of course, by a surgeon. If the disease is well advanced before discovered, as a rule it is too late for operation. If such be the case the indications are to maintain the strength of the patient, relieve the pain and counteract the foul smelling discharge. The first may be accomplished by tonics and out-of-door exercise. These cases, as a rule, are not bedridden until a short time before death. To relieve the pain resort to opium. This is the only drug on which we can rely. Begin with a sixth of a grain four to five times a day, gradually increasing it as needed during the course of the disease. For counteracting the odor of the discharge the best drug to use is permanganate of potash, in a vaginal douche, five grains to two quarts of water. These douches should be used as often during the day.

Auxiliary Treatment.—A woman suffering from this disease should always wear a napkin, which should be burned as soon as removed from her person. Allow plenty of fresh air to circulate in the room. Those who handle any cloths which come in contact with these discharges should wash their hands at once, using plenty of soap and warm water.

DISEASES OF THE UTERUS OR WOMB.

INFLAMMATION OF LINING MEMBRANE OF WOMB (ENDOMETRITIS).

Inflammation of Lining Membrane of Womb.—This is an inflammation of the lining membrane of the womb.

Causes.—Often due to taking cold just before or while menstruating. The introduction of unclean instruments into the womb; the introduction of knitting needles and other instruments by women in an endeavor to produce an abortion. Gonorrhea is oftentimes at the bottom of the trouble. Inflammation of the womb often spreads to this membrane, or the inflammation may begin in this membrane and spread to the womb.

Symptoms.—There is a sensation of weight in the pelvis and slight pain. The discharge is at first profuse, thin and watery, but later becomes thick and tenacious, like the white of an egg. Menstruation may or may not be painful.

Treatment—During the acute attack rest in bed, with an ice bag over the lower part of the abdomen, or if this is not comfortable, a hot water bag. The bowels should be well moved, preferably by a dose of epsom salts. The diet should consist of liquids, cornstarch, gelatine and the like. Large quantities of hot water should be used as vaginal injections three to four times a day.

Inflammation of the Womb.—A new and effective remedy for this disease consists of a mixture of five ounces of vaseline with three drachms of boracic acid. Make this into fifty suppositories and insert one in the vagina each night on retiring; or, if found more convenient, take a small piece of the mass, about the size of a cherry, and insert as above. This treatment serves also to correct irregularity of the menses.

INFLAMMATION OF WALLS OF WOMB (METRITIS).

Inflammation of Walls of Womb.—Metritis is an inflammation of the muscular walls of the womb.

Causes.—The most frequent cause is getting out of bed too soon after a confinement; abortions; exposure to cold during menstruation will give rise to it, also sexual excesses and lacerations of the womb.

Symptoms.—The acute attacks usually begin with a chill, generally followed by a fever. Pain is more or less marked, and may extend down the legs, and be especially troublesome on the left side of the abdomen over the ovary. The monthly flow is apt to be accompanied by a great deal of pain.

Treatment.—The treatment is the same as endometritis.

FIBROUS TUMORS OF THE UTERUS.

Symptoms.—They give rise to pain, more or less severe at times, and to hemorrhages, which may cause death. The pain is especially severe during the menstrual period. The hemorrhages may occur several times between the monthly periods, or the monthly period itself may last for a week to ten days.

Treatment.—For the pain, morphine as a rule is the only drug which affords relief, one-sixth to one-fourth of a grain every four hours. Tincture of gelsemium, ten drops every three hours, may prove of service. For the bleeding try a teaspoonful of the fluid extract of hydrastis every three hours, or a teaspoonful of the fluid extract of ergot every four hours

If drugs fail to control the hemorrhage it may be necessary to pack the vagina with gauze, which pressing against the womb usually controls it.

The following is a very good prescription, which should be tried in all cases of bleeding from the womb:

℞.—Extract of hydrastis fluid (colorless)	1	ounce
Extract of hamamelis fluid	1	"
Extract of ergot fluid	½	"
Peppermint water, to make	3	ounces

M. Sig.—Teaspoonful every four hours.

POLYPUS TUMOR OF THE WOMB.

Character.—This disease, which is one of the most common causes of excessive hemorrhage from the womb at the monthly periods, is of considerable importance. The term polypus is employed to designate especially a tumor which is attached to the inner surface of the womb by a well defined neck or pedicle.

Symptoms.—The most important is profuse menstruation. After a time as the tumor grows larger, and becomes more of an irritant, there are likewise frequent discharges of blood between the periods, often amounting to attacks of flooding. There is also a leucorrheal discharge which may be tinged with blood. Occasionally there are paroxysms of pain.

Treatment.—Unless the tumor is removed the case is hopeless. The operation simply consists in twisting the polypus off of its pedicle or neck. The patient is required to stay in bed ten days to two weeks.

ULCERATION OF THE WOMB.

Cause.—In a majority of cases inflammation of the neck of the womb is soon followed by ulceration. This appears around the neck of the womb, and just within the womb's neck.

Symptoms—1. The inflammations and ulcerations mix and run into each other, resulting in raw places, granulations or pimply surfaces, and hardened parts. Sometimes the pimply patches become red and hard, the whole surface spongy, and bleeding will set in on the slightest touch.

2. As ulceration progresses it wrecks the mouth of the womb and eats deeply into the womb cavity, giving it an unsightly appearance. Pus or matter flows freely at times and at other times scantily. It may be thick and yellow, or thin and of lighter color. A sensation of heat and smarting exists and sometimes severe pain in the right side of the abdomen and in the back part of the head.

Menstruation.—Ulceration generally changes the character of the menstruation. Sometimes it becomes profuse and painful, at others scanty; and then it may be either frequent or tardy, giving rise to distress and pain in the lower part of the bowels and even in the groins and thighs.

Treatment—1. A tea made of the white pond lily affords an excellent remedy. It should be used internally and as an injection; in the former case in doses of half a teacupful three times daily. The fluid extract may be used in place of the tea in ten- to fifteen-drop doses twice a day.

2. Tannic acid, or in place of it a decoction of oak bark, used as an injection night and morning, gives excellent results.

3. The application of tannic acid directly to the ulcers has effected many cures.

4. Half a teaspoonful of boracic acid to a pint of water, injected when warm, and repeated twice a day, is a highly recommended remedy.

5. A decoction of golden seal used twice a day as an injection has been found to give satisfactory relief.

Accessory Treatment.—Where injections are depended upon, their virtue can be increased by simple injections of warm water between-times, and as often as every two or three hours.

CANCER OF THE WOMB.

Character.—The womb is the one part of a woman's body most frequently attacked by cancer. The disease may begin in the neck or the body of the womb. When situated in the neck of the womb it looks not unlike a cauliflower, hence the term "cauliflower cancer."

Causes.—It is more frequent among the whites. The lower classes are more susceptible than the upper. It is extremely rare that a woman who has not borne a child, is ever affected with cancer of the womb. In unmarried women who have had cancer of this organ the confession of an abortion has often been elicited, showing that pregnancy had occurred. As a rule a badly-lacerated cervix (neck of the womb), is very prone to cancer, the disease invariably starting in such a state of affairs.

Heredity plays a more or less important rôle, especially when cancer existed in the mother, or the mother's side of the family.

Symptoms.—In the very early stages they are absent. As the disease progresses the following will appear: 1. Hemorrhages. 2. Uterine discharges. 3. Pain. 4. Visceral disorders. 5. Cachexia.

Hemorrhage.—This is usually the first symptom, and is generally due to ulceration and breaking down of the parts. Unfortunately it is attributed to the irregularities of the menopause, or to a return of the monthly flow after that period. Hence it is the bleeding of cancer is very often disregarded until it has progressed beyond the hope of a cure. The reappearance of hemorrhage two or three years after the menopause is strong proof of cancer and should receive immediate attention.

Examination.—Every woman who has passed the fortieth year, and has vaginal bleeding, or leucorrheal discharge mixed with blood, should at once consult a physician and insist upon an examination being made. Too often women through a mock modesty or for other reasons refuse to have an examination, and this stubbornness has cost many a woman her life. The symptoms of many of the diseases of the womb and ovaries are similar and it requires a thorough examination, at times under an anesthetic, in order to ascertain the true condition of the pelvic organs.

Pain.—This does not appear early, but late in the disease, as a rule too late for an operation. As the disease progresses the pain will spread over the entire portion of the lower abdomen, especially so when the bladder and rectum become involved; the pain is excruciating and intolerable. This torture is constant and does not ease of its own account. A woman suffering from cancer of the womb truly does live a hell upon earth.

Visceral Disorders.—These are generally due to the extension of the disease, or to the pressure of the womb on the surrounding organs. The bladder becomes very irritable, there is a constant desire to pass urine, and the patient will strain and strain in an endeavor to squeeze out a few drops in order to obtain a little relief. As the ulceration progresses fistulæ may develop, the openings extending into the womb, the bowels or the rectum. Constipation becomes very troublesome.

Cachexia.—This is a characteristic symptom, and appears several weeks after the onset of the disease. It consists of a peculiar yellowish discoloration of the skin of the entire body. It is marked by emaciation, and the patient may waste away to "skin and bones."

Treatment.—If seen early and the disease is limited to the womb this organ should be removed at once. If the disease does not return in three years then the woman is fairly safe. But if the disease is not limited to the womb and has spread into the surrounding structures, and an operation be performed, the cancer is very liable, and invariably does, return.

Use of Morphine.—If the woman refuses operation, or should an operation be performed and the disease return, there is only one drug that will ease the pain, and that is morphine. The patient must practically be kept under its influence. In short she becomes an opium fiend, not through choice, but from necessity. This drug may be given, one-quarter of a grain three to four times daily, increasing the dose as required; but always by the advice of a physician.

Checking the Hemorrhage.—If the hemorrhage becomes troublesome it may be necessary to curet the womb in order to control it. Drugs have little or no effect on it. Packing the vagina with antiseptic gauze will at times prove beneficial.

Injections.—The discharge must be attacked with might and main. For this purpose resort entirely to vaginal injections, using permanganate of potassium, seven grains to two quarts of water, three to four times daily; bichloride of mercury, same strength and as often. These douches at times weaken the patient, in that case probably two a day will be sufficient, but never less than this. The odor of the room may be very disagreeable, in order to counteract this place around the floor in saucers, pure carbolic acid, and air the room as often as possible.

DISPLACEMENTS OF THE WOMB.

Character.—The womb, like every other organ of the body, is subject to deviation from its normal position. The womb is situated in the pelvis between the bladder and the rectum. The bladder is attached to the front of the neck of the womb while the rectum is very close to, but not intimately atttached to the back of the womb.

When the womb becomes displaced the whole organ may turn forward, anteversion, or backward, retroversion. Or the womb may bend on itself. If the top of the womb falls forward then it is called anteflexion, or if it should fall backward then it would be retroflexion.

The symptoms and causes of the displacements vary more in degree than kind.

FORWARD DISPLACEMENTS.

Causes.—The most frequent causes are changes in the uterine tissues, following an abortion or confinement. Lack of proper muscular support plays an important part, also congestions, tumors, lacerations of the pelvic floor, tightly fitting clothing, and prolapse of the vagina.

Symptoms.—Dysmenorrhea and sterility are frequently present. Leucorrhea may be troublesome. When the displacement is so great that the womb presses on the bladder, this organ will become irritated, causing frequent urination, and a more or less constant distress in the lower part of the abdomen. This irritation may give rise to inflammation of the bladder.

Treatment.—If the menstruation is painful use the remedies as described for dysmenorrhea. For the leucorrhea, employ the remedies advised for that condition. If inflammation be present local treatments with the hot vaginal douches are to be employed. If a tumor is the cause it should be removed. The ideal treatment is to replace the organ.

BACKWARD DISPLACEMENTS.

These include retroversion and retroflexion. These are the most frequent varieties, and are more or less easily controlled.

Causes.—General lack of muscular tone of the uterine muscles, improper care during confinement, wearing a tight binder too long after being confined, tumors, pregnancy, falls, blows, distended bladder and lacerations of the perineum.

Symptoms.—Painful menstruation, as a rule, the first day or two of the flow, frequent miscarriages, leucorrhea, constant dull aching pain in the small of the back, dragging pains in the lower portion of the abdomen and thighs, headache, constipation, the bowel movements are at times painful, the bladder may be irritable, and at times the urine may escape when the woman laughs heartily.

Treatment.—1. First of all the organ must be replaced in its normal position. If not fastened down by inflammation a physician can replace it; at times an anesthetic may be required. After the organ is replaced the physician will introduce a pessary to keep it in its normal position. A pessary is a rubber ring of various shapes. This instrument should be removed at least once a month, cleansed and replaced. While the pessary is in the vagina, use a douche of lukewarm water once a day. If the pessary feels uncomfortable, or is painful on getting up or sitting down, it should be taken out and replaced; if still giving rise to trouble, it is in all probability too large, and a smaller one should be tried.

2. If inflammation exists, this is to be cured by local treatments and hot vaginal douches. For the leucorrhea, see description of that condition. For constipation, see constipation.

3. If the pessary maintains the uterus in its normal position, and relieves all the symptoms, then it is optional with the patient whether or not she will submit to an operation. If, however, the local treatments, and all other remedies fail to afford relief, then it will become necessary to

open the abdomen, and perform one of the many operations for sewing the womb in its proper position.

4. If the uterus is fastened down by inflammation, local treatments will do no good, and an operation will be the only proper treatment

PROLAPSUS (FALLING) OF THE WOMB.

Prolapsus of the womb is a descent of the organ below its proper position in the pelvis, better known as "falling of the womb," and may occur in two different degrees. The term prolapsus is applied to any falling downward of the organ, which is not so great that the womb passes outside the body; whilst the latter, called procidentia, is that condition in which the uterus escapes partially or entirely beyond the external organs of generation.

Causes.—Falling of the womb is more apt to occur after maturity is attained, and appears especially in those who have led laborious lives, or who have exercised themselves too much in lifting or carrying heavy weights. Hence cooks, laundresses, market-women and nurses, who lift and carry large and heavy infants, are especially liable to suffer from prolapsus. Women who have borne children are more frequently affected than those who are sterile, and lingering or instrumental labors, or getting up too soon after confinement, particularly predispose to it. Among the direct causes may be found congestion, hypertrophy or tumors of the uterus. Violent bearing-down efforts in labor, straining in obstinate constipation and forced respirations, such as occur in coughing, lifting heavy weights, and so forth, are also direct causes of falling of the uterus.

Symptoms.—The symptoms of this complaint are sensations of fullness and weight about the pelvis, wearisome backache, and leucorrhea. Menstruation is not usually interfered with and obstinate constipation is very common.

As the prolapse increases the bladder will be pulled down which will interfere with its functions; such as frequent desire to void urine, the inability to completely empty it each time, resulting in an inflammation of its mucous membrane. The rectum will be dragged down in the same manner, giving rise to more or less difficulty in the bowel movements.

Treatment.—In the first stage, consists in the employment of a pessary to hold the womb up to its proper level. If the perineum is lacerated, this must be repaired, otherwise a pessary will drop out. The only satisfactory treatment for this condition, especially when the womb hangs out, is an operation, which consists in amputating the neck of the womb, sewing up the lacerations of the perineum, and opening the abdomen in order to stitch the womb where it belongs. Nothing else will afford relief. This condition too often generates cancer of the womb, and if the women so affected would only consent to have this operation done they will be free from all the symptoms caused by this displacement, and oftentimes will be fortunate enough to prevent a cancerous growth of these parts.

DISEASES OF THE OVIDUCTS.

The oviducts are two tubes, one on each side of the womb, and convey the egg from the ovary into the uterine cavity each month. These ducts are subjected to inflammatory disease, which may terminate in a good recovery or develop into an abscess.

Salpingitis.—This is an inflammation of the oviduct. It may effect one or both sides.

Causes.—Usually due to gonorrhea, or poisoning following labor, catching cold during the menstrual period, and excessive exercise. A cause usually overlooked is disrobing and lying down in a draught after a prolonged exercise, when the body is very much overheated.

Symptoms.—This disease may be acute or chronic. During the acute stage there will be fever, a great deal of pain on the side of the inflamed tube. This pain is increased on walking or standing. The patient while lying on her back prefers to have the knees drawn up and the lower part of the abdomen is extremely sensitive.

During the chronic stage there is pain in the affected side, which is increased on walking, running up and down stairs, intercourse and sweeping. Menstruation as a rule is painful, coming on a few days before the flow.

Treatment.—Rest in bed during the acute attacks, and thorough purgation of the bowels. Copious hot water vaginal douches, at least twice a day. Ice bags over the lower portion of the abdomen are highly recommended.

DISEASES OF THE OVARIES.

The ovary may be attacked by inflammation, which may or may not form an abscess, tumors, benign and malignant, which may be solid or cystic.

Ovaritis.—By this is meant an inflammation of the ovary.

Cause.—A frequent cause in young girls is too close confinement in school, at work or overstudy. May be due to blood poisoning following a miscarriage or confinement, to gonorrhea, inflammation of the womb, salpingitis and using a cold instead of a hot vaginal douche, standing in a draught after being overheated, or while the body is in an overheated condition, jumping into a very cold bath.

Symptoms.—The pain is excruciating, and is situated low down in the abdomen, near the groin; this pain oftentimes shoots down the leg of the affected side. The pain may extend into the back and hip. The lower part of the abdomen is extremely sensitive, and the sufferer will not permit anyone to touch it. Even the weight of the bed clothing may give rise to so much distress that a prop will be necessary in order to prevent the bedclothing coming in contact with the skin. Fever will be present, the height of which will depend on the severity of the attack. Voiding urine, and the bowel movements may be accompanied by more or less pain. These symptoms occur during an acute attack.

Treatment.—During the acute attack rest in bed is imperative. An ice bag should be applied over the affected ovary, providing the skin is not too sensitive to stand it. If this is not well borne, try a hot water bag, or flaxseed poultice. In addition to these, which always tend to ease the pain, opium should be given by the mouth or with a hypodermic needle. When the pain is so great as to demand opium, of course only a physician should prescribe it.

Accessory Treatment.—At times any of the following drugs may afford relief. Antipyrine five grains every three hours; acetanilide four grains every three to four hours; or the two combined, giving two grains of each every three hours; or the tincture of gelsemium ten drops every three to four hours, in a teaspoonful of water; for reducing the fever tincture of aconite one drop every hour. The following prescription is often of value in all varieties of inflammation of the ovary, irrespective of the cause:

℞.—Tincture of gelsemium	2 drachms
Tincture of cannabis indica	2 "
Peppermint water	3 ounces

One teaspoonful, repeat in two hours, then every three hours.

When the inflammation becomes chronic, local treatments should be persevered in for several weeks; combined with hot vaginal injections. If there be leucorrhea use the remedies advocated under that heading.

If the local treatments do not afford relief then it will be necessary to have an operation, which will consist in removing the ovary if badly diseased, or if slightly so then only that portion which is affected.

Pyosalpinx.—If an acute attack of ovaritis does not get well, or develops into a chronic condition, and pus forms, then it is called pyosalpinx; which means pus in the tube or oviduct.

Symptoms.—They will be those of ovaritis, only more so. Chills may also be present, due to the absorption of the poisonous material from the pus.

Treatment.—This consists in the removal of the ovary and tube, as no other procedure will effect a cure. Too often women suffering from this condition will delay operation until the last possible moment, which delay invariably costs their life.

Displacement of the Ovary.—The ovary may drop down from its normal position, in so doing it always falls back of the womb. This is called prolapsus of the ovary.

Prolapsus of the Ovary—Causes.—Generally due to enlargement of the ovary, which may be caused by inflammation or tumors. A sudden fall or misstep will at times cause an ovary of normal size to fall downward, which will invariably become inflamed.

Symptoms.—Pain located deep down in the pelvis, which may be of a dull aching character, or sharp and shooting. The bowel movements are frequently painful, due to the distended rectum pressing against the ovary. Intercourse is very painful and may be accompanied by nausea.

Treatment.—Local treatments and the use of the hot vaginal douche may afford some relief, but invariably it is necessary to remove the ovary, which operation will require a rest in bed of three to four weeks.

TUMORS OF THE OVARY.

The tumors of the ovary may be solid or cystic. The former may be benign or malignant. The solid tumors are divided into the fibrous, muscular and cancer, the latter of which is extremely rare.

Cystic Tumors of the Ovary.—These cysts are divided into the small and large. The former attain the size of an egg or the fist, while the latter may grow to any size, holding many gallons of liquid.

Causes.—The immediate cause is very obscure; usually due to inflammation of the ovary, sudden amenorrhea, excessive intercourse and blows on the abdomen. These tumors may be present at any age, from infancy to advanced old age, but are most common during the period of sexual activity, between the twentieth and fortieth years. Strange to say they are most frequent in the unmarried woman and those who have not borne children.

Symptoms.—1. The woman may first notice that one side of the abdomen is larger than the other, and later on will be able to feel a lump on that side. This may increase rapidly in size, the whole abdomen becoming distended, and looking not unlike pregnancy. Indeed the woman herself may suspect that she is pregnant. Later on, there will be a sensation of weight in the pelvis, the bowel movements will be painful and the bladder very irritable, due to the pressure of the tumor. Painful and profuse menstruation is of frequent occurrence.

2. As the tumor increases in size there will be pressure symptoms, swelling of the legs, due to pressure on the blood-vessels, the privates may become swollen, due to the pressure on their blood supply; when the tumor becomes sufficiently large to press on or near the diaphragm there will occur shortness of breath. Besides these the face will have a pinched expression, characteristic of this kind of tumor; there will be marked loss of weight and general debility.

3. Pain more or less constant will be present, and at times violent in character. This may be due to peritonitis, caused by the irritation of the tumor.

Treatment.—1. The only cure is, of course, operation. If the cysts are very small, about the size of a pea, they can be removed from the ovary, and this organ allowed to remain. But, on the other hand, if they are the size of a pigeon's egg or larger, then it will be necessary to remove the ovary with the tumor.

2. The old method of tapping the cyst and drawing off its contents is to be condemned as dangerous.

3. The operation of ovariotomy, or removal of the ovary, will necessitate the patient remaining in bed three to four weeks.

LACERATIONS OF THE PERINEUM.

Character.—This consists of tears of the anterior and posterior walls of the vagina, during childbirth. The laceration may extend through the posterior vaginal wall into the perineal body.

Symptoms.—1. When the anterior or front wall of the vagina becomes torn the support of the bladder is usually disturbed, and there will be more or less trouble in voiding urine. In addition there will be an inability to entirely empty the bladder each time, which may result in inflammation of the bladder.

2. When the posterior or back wall of the vagina is torn the symptoms are more marked. This laceration as a rule extends through the muscle which is the main support of the womb from below, by holding up the pelvic floor, and in this way supporting the womb. These muscles are two in number, one on either side.

Treatment.—1. After labor the parts should be thoroughly inspected to see if a laceration has occurred. If so it should be sewed up at the time. When a physician tells a woman that she is torn, and it is no fault of his that such does happen, and desires to insert stitches, she should allow him to do so. Too often women will not permit it, and they regret it only once, and that is as long as they live.

2. If the tears are sewed right after the baby is born they will invariably heal and the parts will be restored to the same condition they were in prior to labor. If not the muscles and tissues do not heal together and the woman will begin to suffer from all kinds of pelvic symptoms, such as forward and backward displacements of the womb, prolapse of this organ, prolapse of the bladder and obstinate constipation.

3. These lacerations are divided into complete and incomplete. The first consists of those in which the tear extends through the bowel, the latter a tear of any extent near, or down to, but not through the bowel. If these lacerations are not repaired at the time, then it will only be a question of time before such an operation will be necessary, so why not permit the physician to do as he thinks best at the time these lacerations occur.

4. If the laceration is complete there will be a loss of control of the bowels, and they will move without the knowledge of the woman. If the tears are not repaired at the time, it is useless to attempt it less than three months after labor, if so a poor result will usually be otained.

GONORRHEA.

Character.—This is an inflammatory disease commonly called "the clap." Greater than any other danger, presented to woman, is sexual intercourse with a man who has gonorrhea or syphilis; the former is the more destructive. The attack of gonorrhea in the male at the time of intercourse may be acute, chronic, or one which had not been thoroughly cured.

A Serious Disease.—While gonorrhea in man in most cases is a trifling disorder, although there are exceptions, in which it leaves a serious condition or becomes fatal, are not so vary rare; in woman it is one of the most serious diseases.

Many an innocent and previously healthy woman, shortly after marriage to a man who supposed himself to have been cured of gonorrhea years before, may get a destructive gonorrheal infection.

Diseases Induced by Gonorrhea.—When we take into consideration that a gonorrheal infection in a woman may cause inflammation of the vulva, vagina, urethra, bladder, lining membrane of the womb, the womb itself, the tubes and the ovaries; that the inflammation of the tubes and ovaries as a rule result in abscesses, nay more, that too often both ovaries have to be removed, and oftentimes the womb with it, then you will realize the dangers of an attack of this disease in a woman.

Causes.—They have been mentioned, intercourse with a man who has had an attack of gonorrhea, or is still suffering from an old attack which has not been thoroughly cured, and yet his physician has probably discharged him as "cured." Very frequently you will hear a person say that it was contracted from a water closet; this is impossible, especially with a man, but, a woman, under very rare circumstances, may come in contact with pus which has escaped from the male on to the seat of the closet. I have never heard of such an instance happening; although it is possible it is extremely improbable.

Symptoms.—1. These consist first, of a burning and itching sensation in the "privates," followed in a day or two by a discharge, which in a few days generally becomes profuse. The pain in these parts then becomes more or less unbearable. Each time the bladder is emptied there is a burning, scalding sensation, due to the urine flowing over the inflamed parts.

2. If the inflammation spreads to the urethra and bladder, there will be all the symptoms of cystitis (which see). If the disease extends to the uterus, there will be all the symptoms of acute inflammation of the womb, which will necessitate the woman going to bed. As the disease spreads to the tubes and ovaries the pain in the lower part of the abdomen will become intense and the fever increase; both of which will become intensified if abscesses form.

Treatment.—This consists in vaginal injections of permanganate of potash, five grains to a quart of hot water four times daily; bichloride of mercury, seven and one-half grains to the quart, same as above; or applications to the vagina of nitrate of silver, thirty to forty grains to the ounce of water. The latter should be done by a physician. A woman who has the symptoms first mentioned may at once suspect she has gonorrhea, and should consult a physician immediately and place herself under his care.

DISEASES OF THE BLADDER.

The bladder may be irritable and yet not inflamed, so a special description will be made.

Irritability of the Bladder.—This may arise from purely functional causes and is of frequent occurrence in nervous women. Oftentimes present in diseases of the womb and vagina, and when the front wall of the vagina has been lacerated. Also present in displacements of the womb. It may follow abdominal operations and parturition (childbirth).

Symptoms.—Similar to those of cystitis. The urine from an irritable bladder is always clear, never contains pus.

Treatment.—Build up the constitution by the use of tonics. (See Anemia.) Regulate the bowels. The following may be tried:

℞.—Atropine sulphate	½	grain
Distilled water	4	ounces

Five drops in water after meals.

If the woman is extremely nervous fifteen grains of the bromide of potassium or sodium every four hours will prove of value.

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Cystitis.—This is an inflammation of the mucous membrane of the bladder and may be acute or chronic.

Causes.—Acute cystitis may be caused by exposure to cold; gonorrhea; dirty instruments, particularly a catheter; pressure of the child during labor; inflammation of the peritoneum or pelvic organs; blows and falls when the bladder is distended with urine, and the improper use of certain drugs.

Chronic cystitis may be a continuation of the acute form, especially by pressure of the uterus during pregnancy, or large tumors.

Symptoms.—**1.** The acute form frequently begins with a chill, followed by fever, which is not very high. There is considerable pain in the lower portion of the abdomen, difficult and painful urination, and the urine is very cloudy. The desire to urinate at night may be very troublesome, and is apt to become more or less constant. There is a continuous feeling of pressure and weight over the bladder.

2. In the chronic condition the pain is not so severe, but the constant desire to pass water, especially at night, is very distressing. When there is a desire to pass water the patient must go at once, being unable to hold her water. If she should lift heavy weights or cough the water may dribble away.

Treatment.—1. All instruments that are introduced into the bladder should be thoroughly cleansed and rendered antiseptic.

The acute form is best treated by rest in bed and an ice bag over the bladder. If the latter is not tolerated, then try a hot water bag. A very good drink is flaxseed tea. If the pain is severe, one-half grain of opium suppository will afford relief, repeating in about three hours if necessary. The following prescription will be found very useful:

℞.—Tincture of aconite	1 drachm
Sweet spirits of nitre	1 ounce
Liquor potassii citratis	6 ounces

A dessertspoonful every four hours.

All alcoholic liquors must be restricted, and the diet should consist of milk and broths.

2. If the disease becomes chronic the patient should be kept on a bland diet. Vegetables, such as asparagus and those containing salts, and all alcoholic liquors should be prohibited.

3. If the urine is highly acid it should be rendered neutral by the benzoate of sodium; if it is alkaline, it should be rendered less irritating by the acetate of citrate of potassium.

4. Salol five grains four times a day is an excellent drug for this condition. Mineral waters such as Bethesda, Vichy and Buffalo Lithia are to be taken, at least several glassfuls a day.

5. Great relief is afforded by washing out the bladder, of course this can be done only by a physician.

6. If the water constantly dribbles away, it may be cured by stretching the neck of the bladder. This will necessitate remaining in bed for about a week.

Stone.—Stone in the bladder of course requires an operation for its removal. There is a prevalent idea that a stone in the bladder can be dissolved by medicines and lithia water. This is a false impression and a great many quacks take advantage of it, generally to extort money from the sufferer.

DISEASES OF THE FEMALE BREAST.

The breast is subject to inflammation, abscesses and tumors.

MASTITIS OR MAMMITIS, INFLAMMATION OF THE BREAST.

Causes.—This may be produced by blows on the breast, or to any of the usual causes of inflammation. It may occur at any age, and in either sex. An acute attack is more often found present in nursing women during the first week or month after delivery. If such happens it is invariably due to cracked nipples.

Symptoms.—At first only an uneasiness of the breast is noticed, then a chill occurs which is usually followed by fever. The gland becomes intensely swollen, red and exceedingly painful. The inflammation may be so great as to cause an abscess.

Treatment.—This consists in preventing an abscess from forming. To accomplish this wash the nipples thoroughly three to four times a day, and stop the baby nursing the affected breast. The breast should be emptied of milk, by the cautious use of the breast pump. Cloths saturated in a solution of lead water and laudanum should be applied several times a day, and over these lay an ice bag.

ABSCESS OF THE BREAST.

If the inflammation does not subside an abscess invariably results.

Treatment.—1. If it appears that pus is forming hot applications should be made, preferably flaxseed poultices, to be renewed as soon as they become cooled.

2. As soon as pus is detected the breast should be incised and the cavity drained.

3. Too often women refuse to allow their physician to lance the breast, thinking it will come to a head and be well in a few days. This is a great mistake. The breast should be freely opened, in order that the pus can easily run out. If necessary an anesthetic should be taken, in order that the physician may accomplish thorough work. At times it may be necessary to insert a drainage tube; depending entirely upon the time which has elapsed from the formation of the pus until the time it is incised.

TUMORS OF THE BREAST.

These may be benign or malignant. Tumors of the former type can be readily removed, and will not give rise to further trouble. On the other hand, those of the latter class, which are of a cancerous nature, are very apt to return, unless operated on early and thoroughly.

CANCER OF THE BREAST.

Character.—Very often a woman will strike her breast against a hard object, or may be struck by a fist. This blow may be followed by a lump, which in a few days may disappear.

Again, a woman while dressing may notice a lump in the breast, and think nothing further about it, or may try to cure it by rubbing in camphorated oil, or other household liniments.

These lumps frequently are the early stages of cancer, and the longer the delay the greater the risk. When a woman discovers a lump in the breast she should consult a physician at once in order that he may properly treat and watch it. If the lump continues to grow and remains hard then he will, or rather, should advise an operation. Under such circumstances these lumps are invariably a beginning cancer.

Treatment.—If the lump is small then it may not be necessary to remove the entire muscles, but simply the breast. On the other hand, if the lump is large and of long standing, or if the breast is immovable, that is, cannot be moved from side to side, then the breast, muscles and all surrounding tissue will demand removal. Recurrence may follow. Many women can be cured of cancer of the breast, providing they will consult a good physician early, which is, as soon as a lump is noticed; and if such does not become smaller or disappear in two weeks, submit at once to an operation.

Beware of Quacks.—It is surprising the number of women who will scorn the advice of a physician, and place themselves under the care of a charlatan or a quack. This class has killed more women than any of the most malignant of diseases, and yet the State will sanction their existence. Beware of quacks, especially when a cancer exists. These deceivers and money extortionists, advertise to remove these growths by the "roots." Such growths have no roots. And yet how many women will stand the torture of the acids which they apply to eat out the tumor, in preference to a clean cut operation, under an anesthetic, which will keep them in bed only two weeks. While the "eating out the roots" process requires a torture of several weeks.

SOME INTERESTING FACTS OF GREAT VALUE TO WOMEN.

Preventing Disease.—Education has a great influence in the development of diseases peculiar to women. During early childhood, when the pelvic organs are undergoing their development, the child must not be confined to the house and at school all day. She should be allowed as many hours recreation a day as feasible, in order that she may enjoy out-door exercise, and obtain all the fresh air possible, which is of so vital importance to her constitution. Too long daily practice at the piano or organ is also harmful.

What to Avoid.—Everything that causes an increase of blood to the womb and ovaries should be avoided. In this category belong sexual excitement brought on by reading suggestive novels; by looking at obscene pictures; by masturbation (self-abuse); sodomy and even normal coition if performed too violently.

Care of the Skin.—The care of the skin is of great importance. Baths, daily or two or three times a week, should be encouraged. The accumulation of dirt blocks up the sweat glands, and nature is unable to throw off the impurities through these vessels. The Jewesses from Russian Poland are very susceptible to disease, and their appearance conveys to one the idea that they never wash their bodies.

Overwork.—All work and no play is a fruitful cause of ill health. Every woman who has the cares of a household should indulge in open-air exercise, or daily walks. Golf, horseback riding, walks, gathering flowers and the like, are to be highly commended, because they combine exercise with open air.

Proper Food.—There is room for improvement regarding food. Many girls have a loathing for food in the morning, and often take nothing but a cup of coffee, and at times not even that, and go to school, and allow their brains to work for hours on an empty stomach. Such a practice is to be condemned in the strongest terms. It is not only a very bad habit, but it spoils the appetite, tends to cause a sour stomach, and impoverishes the blood which leads to nervous disturbances. The same may be said of candy, the immoderate use of which among girls and women corresponds to alcoholic beverages and tobacco in men.

Mode of Dressing.—Some few suggestions regarding the mode of dressing may be of value. One of the most frequent causes of congestion of the pelvis is the "decollete" evening dress and the bell-shaped nether garments. High heels, when worn at an early age are apt to change the normal inclination of the pelvis, a cause of tedious and difficult labors.

Tight Lacing.—Of much more importance is the use of the corset. A loose corset at the best is more or less binding. Tight lacing, of course, should be avoided, it displaces the various organs in the abdomen, pushing them in all directions, excepting the normal, and causes a crowding down of the pelvic organs, hence a fruitful cause of diseases of women.

The Menstrual Period.—Neglect during menstruation is one of the most fruitful causes of female diseases. Dancing and skating during this period should not be permitted. Sexual intercourse at this time, to say the least, is a repulsive habit, yet it is not of rare occurrence. Such a practice is very apt to result in a pyosalpinx (abscess of the oviduct, which see).

Marriage with Disease.—Marriage with existing disease of the pelvic organs is a frequent cause of unhappiness for both husband and wife. Disease of such organs may prove destructive of all sexual desire or may prevent the possibility of conception. But if these should not ensue, there still remains the greater and more appalling danger of defective child development in the womb, or of the actual transmission of disease to offspring. Such calamities are all too frequent, and those who would enter the marriage estate should feel certain that their pelvic organs are free from diseased conditions.

Evil of Abortions.—Abortions, however brought about, play their part in causing inflammatory and nervous wrecks of women. They are the source of many serious and, ofttimes, permanent diseases. Causes of abortion are very numerous. Among those most common are displacement of the womb, ulceration of the neck of the womb, too much exercise, heavy lifting, jar from a slip or fall, strong emetics, powerful purging, etc.

Treatment of Abortion.—If the symptoms are slight, it may be that nothing more than a few days rest will be required, keeping the body as much as possible in a horizontal position, taking occasional cooling drinks, and at bedtime a pill composed of one grain of camphor and two grains of sugar of lead. In addition, a mustard plaster may be applied to the lower part of the back to allay any pain that may be experienced. If the conditions are severe, and flooding should set in, accompanied with marked symptoms of miscarriage, a napkin wetted with cold water, or vinegar and water, should be laid upon the external genitals, and pulverized alum mixed with a little honey must be given internally every half hour. If the symptoms are not thus allayed, recourse must be had to the plugging of the vagina with pieces of cloths soaked in a solution of alum or tannin; fill the vagina full and then place a fold of linen in the genital fissure and apply a bandage. Remove the plug in from five to ten hours, and replace if the discharge continues.

Conception.—Every young couple intending to enter the marriage relation should know what a terrible curse they are liable to transmit to their future children through ignorance of the vital principles which regulate reproduction. This attended to, it then remains with the mother to mold the infant growing within her by being herself at the time what she would like her child to be.

The physical obstacles to conception are chiefly those diseases which have been previously described. When it is dependent on the causes which produce painful menstruation, or profuse menstruation, or a suppression of menstruation, the remedies are the same as are pointed out for those complaints. If inflammation of the ovaries be the cause, a cure may be effected, provided the inflamed condition be removed. If inflammation or ulceration of the neck of the womb be the obstacle, the remedy may be found in the treatment recommended for these affections.

CHANGE OF LIFE (MENOPAUSE).

This is better known as the "change of life," also called the climacteric.

Time and Character.—It comes on gradually, extending over a period of three to four years; it comprises the times when the monthly flow begins to be irregular, gradually diminishes and ceases altogether. As a rule in most women it begins about the age of forty-five, but invariably so between forty-five and fifty years. Those who menstruate early continue to menstruate longer than those who begin late, hence have a late menopause. Those who suffer from a chronic inflammation of the womb or are weakened by severe uterine hemorrhages begin to change life sooner than a healthy woman.

When the menopause comes on gradually the woman is not very liable to have severe disturbances, but if it comes on abruptly the discomforts are very bad, and the general strain of symptoms are marked.

Dangers of the Period.—This period is a critical point of a woman's life. Too often women while passing through this stage pay little attention to it, and every bad symptom is attributed to the "change of life." This is the time of all others that cancer of the womb and breasts are prone to develop. Every woman with a lump in her breast, which develops during this period, should consult a physician at once. Whenever bleeding takes place from the vagina, after the menopause has ended, invariably signifies beginning cancer, and the woman should immediately submit to an examination.

Symptoms—1. The first symptom of the menopause is irregularity in the menstrual flow, as regards the time and quantity. The intervals between the menstrual periods will become extended, say every five to six, seven or eight weeks. Sometimes, on the contrary, menstruation becomes more frequent. The periods last longer, say six to eight days. There will be congestion of the head, causing a red face, headache and indistinct vision, buzzing sounds in the head and ears, dizziness, the sleep is disturbed by dreams, and at the time the flow should occur may have bleeding of the nose.

2. Besides the above, there may be catarrh of the stomach and intestines, congestion of the liver rendering it torpid; the kidney disturbances generally appear in the form of a sediment in the urine. Leucorrhea may be very troublesome. An eruption of the skin of the face may occur, and there may be intense itching, burning or smarting sensations all over the body. The vulva may be the seat of most distressing itching.

3. A very disagreeable feature of the "change" is the fever and sweats; this consists in a rush of blood to the head, the body becomes very warm and then breaks out into a profuse perspiration. This may occur at any time and place. When others think the room very cool, she will think it exceedingly warm.

4. The heart is often affected in the form of palpitations and shortness of breath. The nervous system also shows evidences of a general upset. Sometimes the limbs become very trembly. The temper is subject to great changes, and the sexual appetite may be greatly increased. She may become delirious, or even go insane.

5. The organs of generation undergo marked changes. The uterus, vagina, vulva, ovaries and breast all shrink and become greatly reduced in size.

Treatment.—1. Although this is a perfectly natural process, which is of normal occurrence in every woman's life, conditions will arise demanding interference.

Above all keep the bowels open. For the sediment in the urine it is well to drink Vichy or Seltzer water freely during the day; or to take half a teaspoonful of bicarbonate of soda in a tumblerful of water in the course of the day.

2. The congestion of the head and the disturbances of vision are relieved by hot foot-baths, with or without mustard, and of the cold water eye douche five minutes three times daily.

3. Lukewarm general bath taken three times a week will keep the skin in good condition, which is of value.

4. Those women who have a tendency to stoutness should adhere to a restricted diet, such as fish, meat, green vegetables, lettuce, salad and juicy fruits. Milk and beer are prohibited.

5. The few women who lose flesh must be well fed, and have chocolate and plenty of milk to drink, providing they can digest them.

6. A sudden suppression of the flow during this period is particularly dangerous, hence she should avoid getting the feet wet, wet skin, and should not take a cold bath nor wash the privates with cold water. All these refer to when the menses are present.

7. If hemorrhages occur employ the remedies advocated for the treatment of menorrhagia and metrorrhagia.

8. If the bleeding is quite profuse, pack clean pieces of linen tightly in the vagina, and allow them to remain until a physician is consulted, which should be immediately. This method of packing the vagina will control the bleeding until the physician arrives and institutes more radical measures.

ABORTION.

Meaning.—Abortion is the expulsion of the product of conception from the womb. It is also called miscarriage, by which name it is better known. Amongst the laity at large the term miscarriage is generally used when this accident happens without any violence on the part of the mother, whereas abortion is applied when attempts have been made to bring on this condition by the introduction into the womb of instruments.

Divisions.—Abortion has been divided into spontaneous or natural and accidental. A better division is spontaneous and artificial. The latter class is divided into therapeutic and criminal; therapeutic abortion is that in which it is done by the physician in the interest of the mother's life or health, while criminal abortion is without this or any other justification. It is further divided into complete and incomplete; threatened and inevitable.

Complete Abortion.—By complete is meant that all the product of conception, fetus and afterbirth, is expelled; incomplete, when only a part of it comes away, invariably the fetus, the afterbirth or part of it remaining in the womb; when the symptoms of an abortion appear, and it can be checked, it is spoken of as a threatened abortion; whereas if it is inevitable, when in spite of all that is done, miscarriage occurs.

Criminal Abortions.—The greater number of miscarriages occur in the first three months of pregnancy. It has been shown by statistics that criminal abortion is more frequent from the third to the sixth month than in the first two months. The explanation of this fact is due, that up to three months the woman hopes that there is simply a delay in the appearance of the flow, but when this hope fails she is ready to resort to any procedure to end a pregnancy which now becomes almost certain; on the other hand when six months have elapsed the life of the child has become so manifest that she shrinks from its destruction. Movements of the fetus in the womb make successful appeals to the mother's conscience, if not to her love also, for the salvation of the new life which dwells within her womb as its sanctuary.

Dangers of Abortion.—It is surprising the number of criminal abortions that occur yearly, and which fail to come to notice, unless the victim dies, when an exposé is made by the coroner. And even then many women die with the names of the abortionist and her seducer sealed upon her cold lips. Women do not for one instant think of the damage which is wrought to their generative organs, when they introduce a knitting needle or "what not" into the womb in order "to open it," so that a miscarriage will occur. Inflammations, displacements of the womb, and pelvic abscesses, and abscesses of the ovaries too frequently follow these foolhardy attempts. How many women have sacrificed their lives in this criminal and damnable manner?

Causes.—1. The causes of this unfortunate condition are numerous, they may be due to disease of the fetus, placenta, womb or the mother. Then again the father may be at fault. For instance, men who are confirmed alcoholics, or suffering from consumption or syphilis will invariably have a serious effect on their offspring, in that if pregnancy should occur the fetus dies within a month or so after conception. Abortion is of frequent occurrence in the wives of men who work in lead.

2. Violent exercise, as running, dancing, jumping, riding on a hard trotting horse or over a rough road; lifting heavy weights, falls, blows, tight corsets, surgical operations, especially if on the organs of generation, are very prone to cause an abortion. Frequency of intercourse is not an unfrequent cause.

3. Among other causes which may be attributed to the mother, are infectious diseases, such as typhoid fever, during which she is very apt to abort; syphilis, this is one of the most frequent causes; backward displacement of the womb plays a very important part in this condition; a pregnant woman working in a tobacco factory is very liable to miscarry.

4. Again violent sneezing or cough may be the cause. Tumors of the womb and malignant disease of this organ are also active factors; though as a rule a woman with cancer of the womb rarely becomes pregnant, the same applies to large fibrous tumors, and the smaller when located in the cavity of the womb. High altitudes will also produce an

abortion, and it is asserted that in certain mountainous countries pregnant women descend to the valleys to escape the accident.

5. Medicines play an important rôle in the causation of this accident, such as active cathartics, laxatives and even emetics. The administration of quinine has been followed by miscarriage, although oftentimes it has been attributed to the disease and not to the medicine. But many of these drugs cannot be blamed for the accident, as there usually exists a tendency of some kind to a miscarriage.

6. The fetus may be affected by the same diseases as the mother, which if it should cause the death of the fetus will produce an abortion. Excessive distension of the womb due to plural pregnancy is apt to produce premature contractions of the womb, with a resulting miscarriage.

Symptoms—1. There may be premonitory symptoms such as flushing of the face, alternate flushes, and of heat and chilliness, pain in the back, irritability of the bladder which may extend to the rectum.

The characteristic symptoms are hemorrhage and pains. These pains begin in the lower part of the abdomen and on both sides of the same, in the groin or just above it. As the condition progresses these pains extend to the back, and later on pass around to the front. The pains begin first, to be soon followed by a bloody discharge, or vice versa. Some cases have a gush of watery fluid early in the attack, which may be slightly discolored with blood; this discharge does not necessarily indicate rupture of the ovum and hence that miscarriage is inevitable, for it may occur from inflammatory diseases of the womb.

2. The flow of blood is very much greater than that which occurs in menstruation; large clots are very apt to be passed, in which, if carefully sought for, the ovum may be found.

3. After seven or eight weeks of pregnancy the symptoms of abortion are quite plain. Prior to that time it may be mistaken for a case of painful menstruation.

4. If the pregnancy has advanced beyond three months the fetus as a rule escapes first, soon to be followed by the afterbirth. If the afterbirth is not expelled the woman is liable to suffer from hemorrhages until it is removed. These hemorrhages may be so great as to cause a fatal result, providing the woman has not a physician in attendance.

Treatment—1. If a woman is subject to repeated miscarriages she should exercise every care to place herself in the best surroundings during each pregnancy. At the regular time each monthly flow is expected she should remain in bed for a few days, this will give the body absolute rest and may tide her over to full time. If she has been in the habit of aborting at a special time, say the third or fourth month, when that period is reached she should go to bed several days before the time expected and remain there at least two weeks.

2. If the abortions are due to syphilis, a course of mercury and iodide of potash should be instituted. If due to a backward displacement of the womb, this should be corrected by placing the womb in its normal position and holding it there with a pessary, or by an operation if necessary. Sexual intercourse during pregnancy should be prohibited, as this is a very frequent cause of miscarriage.

3. When a pregnant woman feels pains in the lower part of the abdomen, soon followed by the discharge of blood, or a sudden discharge of blood followed by pain, she has in all probability a threatened miscarriage. She should loosen all her clothing and lie down; her drinks should be cold; twenty drops of laudanum with half a teacupful of water should be injected into the rectum, or a half grain opium suppository may be inserted. If the symptoms are not abated in one hour the injection or suppository should be repeated, and again at the end of the second and third hours if needed. If the patient is very restless and nervous, twenty to thirty grains of chloral may be added to one of the opium injections; if such is done do not use warm water, but the yolk of an egg and some warm milk, in order to prevent the drug from irritating the bowel.

4. The opium may be continued from day to day as long as there is hope of arresting the abortion. Meantime once in two days the bowels should be opened by a warm water injection, or by a mild laxative. Should the pain and hemorrhage cease it is better for the patient to remain in bed for three or four days after this cessation; when she gets up she should only gradually resume her usual habits of life, even then as an experiment, and be prepared to return to bed at the first recurrence of the former symptoms.

5. Unfortunately in the majority of cases the hemorrhages do not cease, or having stopped return, and the abortion is apparently inevitable, or the flow may be so great that it will be necessary to complete the abortion in order to save the life of the woman.

6. If the abortion is inevitable stop the bleeding and empty the womb. Hot water injections may be valuable to accomplish the former. If they do not suffice, then the vagina should be tightly packed with antiseptic gauze, antiseptic lamb's wool, or pieces of boiled linen or muslin. In order to hold the packing in place a napkin should be tightly applied.

7. When an inevitable abortion is assured the physician may pack the

vagina with tampons and allow them to remain for eighteen or twenty-four hours, and usually when removed the ovum (if it has not been previously expelled) and the after-birth will be found forced out of the womb. If the after-birth does not come away in twenty-four hours the woman should be placed under an anesthetic and the womb emptied of its contents. If not the discharge in a few days will have a very bad odor, and the patient develop blood poisoning.

Every woman who has a miscarriage should remain in bed at least ten days to two weeks after such an occurrence. The women who do not properly attend to this accident are the ones who later in after life pay the penalty, which either means chronic invalidism, or the removal of one or all of her pelvic organs which may or may not result in death.

CONCEPTION.

Character.—A woman who has conceived is pregnant; pregnancy begins with conception and ends with labor, providing an abortion does not occur. It is normal when the uterine cavity contains the fecundated ovule or ovules; and abnormal, ectopic or extra-uterine, should it or they be outside of that cavity.

The Ovule or Egg.—Each month when menstruation occurs an egg or ovule, as it is called, escapes from the ovary. An ovule may come from the one ovary, or from both, or two or more may come from the one, and so forth. Leading from the ovary into the cavity of the womb is a tube called the oviduct. When the egg or ovule drops from the ovary, it falls into the end of this tube, which by a wave-like motion conveys it to the cavity of the womb, where it remains until the next menstrual period, when it is carried off with the flow. A new one is then deposited.

Twins.—If one ovule passes down and the woman becomes pregnant that month the result will be one baby; if there are two ovules and impregnation occurs, the result will be twins, and so on.

Ectopic Pregnancy.—On account of disease, or from other causes, the progress of the ovule or egg may become obstructed, then the egg or eggs will become lodged in the tube. Should it or they become impregnated while lodged in the tube, the pregnancy will be an extra-uterine or ectoptic pregnancy.

How Pregnancy Occurs.—How does impregnation occur? When the male has intercourse with the female the semen of the male is deposited in the vagina of the female in such a position as to "bathe" the neck of the womb. The heat of the parts causes this gelatinous seminal discharge to liquefy. The semen is merely a solution to convey the spermatozoids. The spermatozoid is composed of a head, of a tail and of an intermediate segment, sometimes called the body. The entire length of the human spermatozoid is not more than 1-500 to 1-325 of an inch. The spermatozoids have an eel-like motion, the tail being the motile power. The spermatozoids move along until one of them comes in contact with the ovule, the head then enters the latter, and the tail drops off. Conception then occurs. Although there are thousands of the spermatozoids in each seminal discharge it only requires one to fecundate the ovule.

Movement of Spermatozoids.—Their rate of movement varies. It has been estimated about three inches in three hours. They have been found alive in men who have been executed seventy and even seventy-two hours after death. In the human female they were found endowed with active movements in the neck of the womb seven or eight days after coition. In temperate climates boys of twelve years may have discharges simulating the seminal fluid, but it is unusual for spermatozoids to be found in these discharges before they are fifteen or sixteen years old. One careful investigator claims that about one-half of men between sixty and eighty years of age are capable of fecundation.

STERILITY.

Causes.—1. When a woman is unable to become pregnant she is said to be sterile or barren. At least one marriage out of every eight is childless. It is commonly believed that the fault is always, or nearly always, to be found in the wife, but modern investigation has shown that the husband is at fault in about one case out of every six. When the male is at fault it may be due to impotence, which is an inability to perform the sexual act to aspermatism, although he may succeed in getting an erection he may be unable to have an ejaculation of semen; or to zoöspermia, the condition in which the ejaculated semen does not contain spermatozoids, and, therefore, has no fertilizing power. Or again the testicles may be improperly developed.

2.—If the female is at fault it may be due to the absence of the ova. In chronic inflammatory diseases of the ovaries the ovule may disappear, or the end of the oviduct may become closed. If such be the case, the egg will drop into the general peritoneal cavity and be absorbed. Another cause is incapacity for sexual intercourse, such as absence of the female organs of intercourse, inflammatory diseases and tumors of the vulva and vagina. If the perineum is badly torn the seminal fluid will flow out, a cause of sterility.

3. A frequent cause is a very small opening in the neck of the womb, which is not sufficiently large to permit the spermatozoids to enter.

Treatment.—If due to inflammatory disease resort to the remedies described for the various inflammations of the generative organs.

If the end of the oviduct is occluded, and tumors are present, or should the perineum be badly torn, or a small opening in the neck of the womb be the cause, then an appropriate operation will be the only procedure which will tend toward future conception.

Lack of Orgasm.—A condition for which a physician is frequently consulted is lack of the normal feeling of the highest sexual excitement, called orgasm. With such the fault is probably due to some imperfection in the nervous system. The lack of orgasm may be found in otherwise healthy women, and not a barrier to conception.

In those who have never experienced the orgasm it is incurable. With others the use of tonics, galvanic battery, and such drugs as damiana, phosphorus and cantharides may prove of value.

UTERINE PREGNANCY.

Nature's Most Wonderful Miracle.—It has been well said that every pregnant woman should be looked upon as a laboratory in which nature is performing that most wonderful of all her miracles, the fashioning of a new human being, and that nothing should be allowed in any way to disturb or derange this most important operation. Could such an idea be constantly kept in mind not only by mothers themselves, but by all those who surround or even momentarily approach the female who is performing the most sublime duty of her sex, that of continuing the race, and every effort made to aid her in accomplishing this great function in the most perfect manner possible, what vast improvements might be looked for, even in the next generation of mankind.

First Indication of Pregnancy.—The first indication of pregnancy is generally the stoppage of the monthly periods, and it is also one of the most reliable of the early indications. It should be remembered, however, that there is no certain sign of pregnancy, none which has not been found to fail, and lead into errors which were profoundly mortifying, if not worse, up to the time when the heart of the infant can be heard to beat through the walls of the mother's abdomen. This beat of the child's heart can seldom be positively identified before the fifth month, and often not until the sixth.

Failure of Signs.—In some instances pregnancy may occur and yet the monthly flow continue. This is quite common for one or two months, and less frequent for four or five. In fact, some mothers assert that the first intimation they had of being pregnant was quickening or feeling the motion of the child, which generally makes itself evident about four and a half months from the date of conception.

The Morning Sickness.—Morning sickness occurs with most females for the first few months of pregnancy, and some females when pregnant suffer intensely from it. It usually comes on whilst dressing, not being felt on first getting up, and when not very severe often passes off later in the day to recur, however, the next morning. It differs from other forms of sickness, such as those which are due to disease of the stomach itself, in that as soon as the vomiting is over the patient is often perfectly well again, and can take food immediately afterward. The sensitiveness of the stomach to odors and flavors, and the peculiar ease with which feelings of nausea are brought on by such impressions is a very significant sign, and rarely fails, if supported by the other usual symptoms, to indicate pregnancy when it is well marked.

Changes in Mammary Gland.—Changes which occur in the mammary glands are valuable corroborative signs. They consist in the enlargement and puffiness of the nipple, the darkening and increase of size of the areola, and occasionally the secretion of milk. These indications show themselves during the second and third months.

Quickening Period.—Quickening is the feeling of the movements of the child, which is so constantly noticed by the mother about the end of four and a half months, or just half way through the pregnancy, that it often helps to fix the time of the approaching confinement. The first sensation is described as being like the fluttering of a bird, or the creeping of an insect, but after a few weeks it becomes progressively more decided, and more perceptibly like the struggles of an infant with human arms and legs. The popular idea that up to the time of quickening the child in the womb is not alive is, of course, totally erroneous, because if the infant was not living from the very day of conception it would not grow and develop. It is only felt primarily at this period because before the date of quickening its struggles have been too feeble and made too deeply in the cavity of the abdomen to be perceptible.

Changes in Abdomen.—In the early months of pregnancy the abdomen is often even flatter than in the unimpregnated female, but after the period of quickening enlargement occurs, and in the latter months becomes so great as to cause, in many instances, a good deal of distress by mere pres-

OVARY AND MAMMARY GLAND.

FIGURE No. 1.—The ovary, showing the vesicular bursted and the large grums which fills its cavity.

FIGURE No. 2.—Change in the breast from pregnancy.

A. Nipple.
B. Sebaceus tubercles.
C. Spots in the branded areolo.
D. Marks due to the enlargement of the skin.

FIGURE No. 3.—Lobes of a mammary gland.

A. Acinos.
B. Canaliculi or small canals.
C. Conduit formed by several small canals.

FIGURE No. 4.—Mammary gland.

FIGURE No. 5.—Mammary gland in woman.

a. Nipple.
b. Areola.
c, c, c, c, c. The gland lobes.
1. Breast or enlarged part of one of the conduits which carry milk.
2. Extremities of the conduits which carry milk.

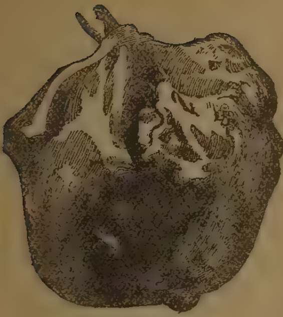
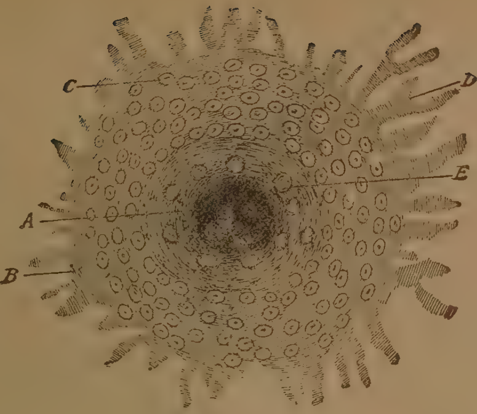


Figure No. 1.



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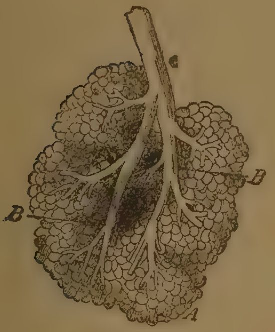

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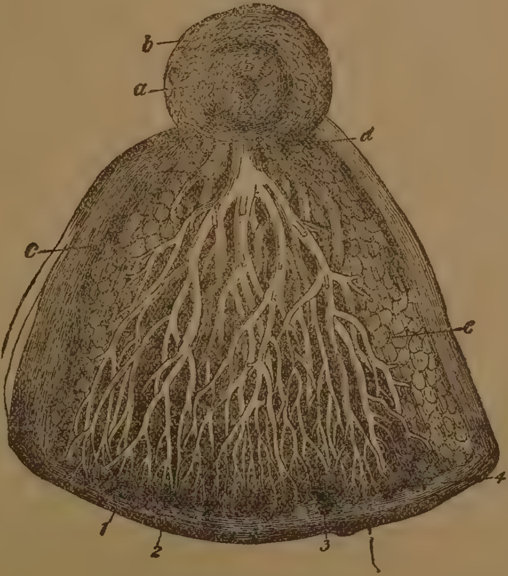


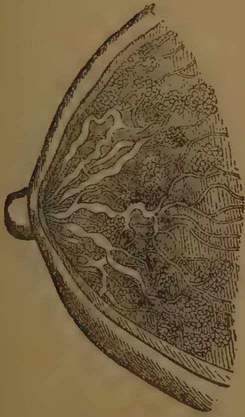


Figure No. 4.

Figure No. 5.

OVARY AND MAMMARY GLAND.

For an explanation of the illustrations see text on opposite page.

sure, distension and weight. The stretching of the skin necessary to render it capable of covering the uterine tumor generally gives rise to numerous cracks in its surface, which remain as whitish scars through after life.

Changes in Disposition.—Changes in temper and disposition, longings for strange and unsuitable food, drowsiness, toothache, heartburn, palpitation of the heart, and so forth, are less constant and therefore less reliable symptoms of pregnancy, some of which, however, occur in a large proportion of the cases.

Duration of Pregnancy.—This average date is usually considered for the fruit of the womb two hundred and eighty days, or forty weeks, or a week over nine calendar months, from the day of the cessation of the menstrual discharge when last seen at the commencement of pregnancy. In order to be able to make this calculation accurately it is a good plan for every married woman to keep upon a calendar a regular account of the day in each month when she ceases to be unwell, so that if at any time before the next period impregnation should occur, she may have at hand the precise datum upon which to base her preparations. The date of quickening, when that is a prominent symptom, as is the case in most pregnancies, ought also to be carefully noted.

Pregnancy Table.—The table given below is one which will prove reasonably accurate:

Jan.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Oct.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*Nov.*
Feb.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	...	...	...	
Nov.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	...	...	...	*Dec.*
March	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Dec.	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	*Jan.*
April	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	...	
Jan.	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	...	*Feb.*
May	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Feb.	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	*March*
June	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	...	
March	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	...	*April*
July	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	3	
April	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	*May.*
Aug.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*June*
Sept.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	...	
June	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	...	*July*
Oct.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*Aug.*
Nov.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	...	
Aug.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	...	*Sept.*
Dec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Sept.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	*Oct.*

Explanation.—Find in the top line the date of the last menstruation the figure below will indicate the date when the confinement may be expected. If the date of menstruation is April 8, then the date of expected confinement will be January 13.

Care During Pregnancy.—The pregnant woman should ask herself, before making even a trivial variation from habits of life, which have been proved by experience conducive to her individual health, "can this change produce any injurious effect upon the future, mental or physical, of my darling baby?" and unless the answer is unequivocally in the negative, it is her duty to refrain from incurring unknown risks by alteration of diet, exercise, sleep, clothing, and so forth, which, previous experience has taught her, contribute most effectually to the preservation of her perfect sanitary condition.

Food During Pregnancy.—The amount of food taken into the system during the early period of pregnancy, as intimated by nature in the broad hint of morning sickness, should be rather less and of a more easily digested quality than at ordinary times. But in the latter months, when the infant is rapidly developing and material must be supplied for muscles and bones in abundance, the quantity of aliment should be largely increased. It is better, however, to eat more frequently than to run any risk of over-loading the stomach at such a time.

Exercise.—The amount of exercise should also be ample, since this is vitally important for the proper assimilation of food into the blood, whence it is transferred to the fetus in the womb, and contributes, of course, every atom of the material composing the little body. Care must be taken, however, to avoid violent exercise of any kind for fear of bringing on abortion with all its dangers to the mother, and in the earlier months with certain destruction to the child.

Child Blemishes.—As regards the production of blemishes and deformities in the infant by mental impressions of the mother during pregnancy, there is a large amount of evidence that such an effect is produced, although many of the stories of such occurrences are grossly exaggerated or totally without foundation. At the same time a calm and equable frame of mind is greatly to be desired during the whole period, and anything which is likely to operate in the direction of causing mental shock, depression or excitement should be scrupulously avoided.

Treatment.—1. Among the diseases of pregnancy are excessive vomiting, which may be treated with tablespoonful doses of lime-water, iced carbonic acid water, or iced champagne, ginger, bismuth, hydrocyanic acid, and two-grain doses of oxalate of cerium; heart-burn, from which half a teaspoonful of bicarbonate of soda or ten drops of aromatic spirits of ammonia affords relief.

2. If the nausea is due to a prolapsed or backward displaced womb the condition will be relieved by replacing the womb and inserting a lamb's wool tampon. A method which often suffices is to give the mother a cup of hot tea and a cracker about an hour before she arises.

3. Any of the following, cocaine in the dose of two to three drops of a 4 per cent. water solution, every fifteen minutes until ten doses are taken; one drop of tincture of aconite every hour; and tincture of nux vomica, ten drops in water every four hours.

The following prescriptions are advocated:

Tincture of nux vomica	2	drachms
Hydrochloric acid	½	ounce
Essence of pepsin	3	ounces

Teaspoonful after each meal and at bed-time.

Or,

Bismuth subnitrate	2	drachms
Tincture of aconite	10	drops

Make into ten powders. One powder every hour.

Or,

Carbolic acid or creosote	10	drops
Subnitrate of bismuth	2	drachms

Make into ten powders. One every two hours.

Treatment of Excessive Vomiting.—The nausea and vomiting may be so pronounced as to be uncontrollable and is then called the hyperemesis of pregnancy. When this exists nothing will remain on the stomach, and the woman rapidly loses flesh and becomes very much exhausted. When blood appears in the vomited matter of these cases the termination, as a rule, is unfavorable.

The treatment consists of emptying the womb, in other words, producing an abortion, and is one of the exceedingly few reasons for which a physician is justified in producing an abortion.

Treatment of the Constipation.—Constipation, which must be meddled with very cautiously by the aid of mild saline laxatives, such as a teaspoonful of rochelle salt, a dessertspoonful of castor oil, or injections of soap and water; and piles, the discomfort of which can be palliated only by the use of some such ointment as that already recommended.

Treatment of the Toothache.—If toothache comes on care must be taken that sound teeth are not extracted in the vain hope of relieving it. When teeth decay rapidly in pregnancy it seems sometimes to be due to the removal of the bony materials for the purpose of building up the skeleton of the fetus, and efforts should be made by supplying the lime salts as phosphates or hypophosphites mixed with the food to remedy the difficulty. Finely powdered bones have been shrewdly recommended.

Treatment of the Enlarged Veins.—Enlargement of the veins of the legs should be treated by bandages or elastic stockings, and dropsy of the feet and ankles should lead to an immediate examination of the urine, lest some tendency to albuminuria may be threatening.

Treatment of the Bladder.—Irritation about the bladder, perhaps with incontinence and retention, occasion much inconvenience, but can often be relieved by gentle laxatives and diuretics, such as the cream of tartar, or, if very troublesome, by a belladonna and opium suppository. The patient should, however, be guarded against the possibility of becoming fond of the action of anodynes, especially opium or chloral, at this trying time.

LABOR.

Definition.—Labor is the end of pregnancy, and may be defined as the process by which the fetus and the afterbirth are separated from the mother. Nature's design being the continuance of the race, the fetus must have reached such development before its expulsion that it is viable, that is, capable of living external to the mother. If, therefore, the product of conception be expelled before such capability, the process is not called labor, but abortion or miscarriage.

Premature Labor.—Should labor occur in the seventh or eighth month it is called premature, because the fetus has not attained its perfect development; if labor be delayed beyond nine months it is called postponed, if the fetus be alive, but missed labor if it be dead.

Parturition.—Parturition is a term very often used instead of labor. When parturition occurs, with the efforts of the womb and the woman alone, it is called natural; but if it is necessary to render aid, usually by the application of forceps, it is called an artificial or instrumental labor. In order that a labor may be natural the fetus must not exceed the normal size and the presentation must be normal, also the passageway and the muscular forces required to cause the expulsion of the passenger.

Duration of Labor.—This varies with race, place, climate, manner of living, heredity, physical conformation, whether first or subsequent labor, and with the sex, presentation and position of the child. Labor is shorter in warm than in cold climates, in savage than in civilized races, in women in the country accustomed to plain food, out-door exercises and regular habits, than in those leading opposite lives in the city. In the primipara (a woman who is having her first baby) it is longer than in the multipara (a woman who has had more than one child); it is also longer when the face or buttocks come first instead of the head, and with male than female children.

Labor with First Child.—As a rule the primipara is in labor fifteen to twenty hours; the multipara six to eight hours. If the primipara is thirty-five years old and more, labor may be prolonged for twenty-one to twenty-seven hours; above forty-one years labor is very apt to be thirty-three hours.

Duration of Second Stage.—The second stage of labor is generally one-third that of the first stage. The majority of labors begin between 9 and 12 P. M., and end between 9 P. M. and 9 A. M.

Birth Presentation.—The presentation of the child varies. By far the greater majority of the children are born head first. The child may present by the head, buttocks (when it is called a breech), face and either shoulder. The vertex or head may demand forceps application at times, especially if at the expiration of any hour during the second stage it fails to progress. Should the face present, the physician will endeavor to push it up and change it to a vertex, otherwise it will be necessary to apply forceps. Such a child will have a blackened face, which discoloration at the end of a week or ten days will disappear.

Buttock Presentation.—If the buttocks present, more or less difficulty will occur and it may be necessary to apply force to the after-coming head.

Shoulder Presentation.—A shoulder presentation will require an entire change of the position of the child, as this is an impossible labor. As a rule both feet are brought down first, the head being born last.

Preparations for Labor.—The lying-in chamber should be large enough for suitable ventilation, and yet not so large as to be with difficulty heated. Every precaution to secure for the invalid a full supply of unpolluted air should be instituted, and conveniences for affording hot water at short notice are of importance. The bed should be a hair or spring mattress, which ought to be covered with some water-proof material; over this a thick, old spread, newspapers or comfortable, to absorb the blood and other discharges, should be laid, and this again covered with a sheet. The remaining bed-covering must be arranged according to the season of the year. In this room should be collected all the clothing which will be needed for the comfort of the mother and expected infant, and besides the articles of every-day use there should be provided a strong sheet, which can be tied around the post at the foot of the bed, for the patient to pull upon during her pains, a firm cushion for her to press her feet against if she so desires, an abundant supply of towels, plenty of soap and warm water, a pound or so of lard free from salt, a few yards of flannel, a soft, warm shawl or small blanket to receive the baby in before it is washed, sharp-edged but blunt-pointed scissors to cut the cord or navel string, eight yards of coarse sewing cotton doubled eight times and knotted at the two ends for tying the cord, a binder of strong new muslin about a yard and a half in length and half a yard wide, or larger if needful, and a paper of large strong safety pins for fastening the same around the invalid's abdomen after she is delivered.

The Mother's Dress.—The dress of the patient should be the usual chemise and night-dress rolled up around her waist, so as to keep them from being soiled, and a sheet folded in four and pinned around her limbs as a skirt, fastening it at the right side so that it can easily be unpinnned and slipped down out of the way when the labor is completed.

Stages of Labor.—Labor, parturition or confinement, is divided into three stages. The first consists in the dilation of the mouth of the womb, sufficiently large to permit the fetus to escape. The second constitutes the birth of the child. The third is the expulsion of the placenta or afterbirth.

First Stage of Labor.—During the first stage of labor the patient may walk about the room, sit up in a chair or lie upon a lounge, as is most agreeable to her, but when the mouth of the uterus is dilated to the size of a silver half dollar she should take her position upon her left side, with her hips near the edge of the bed, and about a foot lower down than she is accustomed to lying. In this posture the medical attendant can best aid her in her trial until toward the end of the process, when some advantage is often gained by placing the patient upon her back.

Preparing the Nipples.—Preparation of the nipples should be made by washing them with strong green tea, or solution of a drachm of tannin in two ounces of cologne water, twice daily for three weeks before confinement, in order to harden the skin and render it less liable to crack and become sore whilst nursing.

Period of Actual Labor.—The period of actual labor is generally ushered in with slight griping pains in the abdomen, and more or less aching in the back, which come on at first, perhaps, at intervals of half an hour, lasting for a minute at a time; then at intervals of ten or fifteen minutes, and so on until they grow severe and the space of respite between them dwindles to five, four, or even three minutes.

Pains and Length of First Stage.—In the first stage of labor the pains have a cutting or tearing character, and are commonly felt in the stomach, or lower part of the abdomen, and also in the back. They are accompanied by a frequent desire to pass water, produced by the pressure of the child's head upon the urinary bladder as it descends, and often by a disposition to evacuate the bowels, from a similar cause. Pressure of the head likewise frequently produces severe cramps in the legs, which may be partly relieved by friction, but often disappears as the labor progresses. The duration of this stage varies greatly, but in a labor of twelve hours' duration, the usual proportion would probably be ten hours in the first stage, an hour and three-quarters in the second stage, and fifteen minutes in the third.

Pains of Second Labor.—In the second stage of labor the character of the pains and the expulsive efforts which accompany them is changed. They now become what are commonly called bearing-down pains, in which the patient almost instinctively endeavors to aid the contractions of the uterus in its efforts to empty itself, by straining as if at stool; and, indeed, should she seem reluctant to yield to this disposition, she ought to be instructed to bear down exactly as if her bowels were being moved whilst constipated. The cries emitted are generally more like prolonged grunts, and can be readily recognized at a considerable distance by one who is familiar with their peculiarities. After a continuance of these pains for one, two or more hours the child's head, if that comes first, as happens in probably nineteen out of every twenty cases, begins to press upon the external parts or vulva, and finally, with an unusually forcible pain, often with a piercing cry from the mother, her baby's head emerges into the world. As a rule, the next pain expels the shoulders and hips, the rest of the body offering little resistance to the expulsive efforts of the womb after the head is born.

Third Stage of Labor.—The third stage, consisting in the delivery of the placenta, is usually attended with one or two slight pains, by which the after-birth is forced out of the womb into the vagina, whence it must usually be removed by the medical attendant.

Although in the majority of cases any intelligent person could successfully manage a case of labor, there are numerous accidents, malpositions and complications, which may occur without any warning in any particular case, so that if skilled medical assistance can possibly be procured it should by all means be sent for. The man or woman who neglects this runs a terrible risk of being the murderer of the mother, or of the child, perhaps of both.

Duty of Midwife.—But if no qualified physician is procurable, the acting midwife should from time to time, say every ten minutes during the second stage of labor, anoint the vulva or external parts of generation of the patient freely with lard, at the same time examining very gently, with the finger, what progress is being made in the descent of the head, supposing, as is usually the case, that forms the presenting part, as this too frequently causes puerperal sepsis, which see.

The Delivery.—The moment the head is born the finger should be repassed in around the infant's neck, so as to find out whether the navel-string is wound around it, as not unfrequently happens. If such is the case, the cord should be pulled down a little, and the mother urged to bear down for the child's sake, as rapidly as possible, and complete the birth; when the cord must be immediately loosened and slipped over the baby's head to save it from strangulation. At the same moment the head of the child comes into the world the midwife's other hand should be placed upon the lower portion of the mother's abdomen, and the uterus pressed upon gently.

Treating the Womb.—As the body of the child is born the uterus should contract to the size of a ball, apparently about five inches in diameter, and if this does not take place, the womb should be firmly grasped through the walls of the abdomen, in the hand, and so stimulated to due contraction. This is very important, because, if it does not occur promptly the patient may bleed to death in a very few minutes.

Attending the Child.—As soon as the womb is found to be properly contracted into this hard ball, attention should be turned to the child. If it cries at once, the cord may be immediately tied an inch and a half from its attachment to the infant, with the sewing-cotton already provided, and then cut half an inch above this again, that is, half an inch further away from the child, squarely off. The baby is then to be lifted up, with both hands clasped around its body, for it is very slippery, and received by an attendant in the flannel or old blanket, which has also been prepared. The attendant ought either to hold it until the labor is completed, or to place it on its left side, in some safe situation, preferably in its cradle or crib, not in an arm-chair, where it may be crushed to death by being sat upon.

Expelling the After-birth.—During this time the midwife should keep her hand upon the patient's abdomen, gently pressing and kneading the womb occasionally, in order to promote the recurrence of a contraction, strong enough to expel the placenta. As long as the after-birth remains the woman is not safe from dangerous or fatal flooding; but whilst the uterus continues firmly contracted, and feels like a hard ball under the fingers of the midwife, there is but little danger. After five or ten minutes, if slight pains come on, the mother should bear down a little, and the cord be gently pulled upon, when, in many instances, the placenta comes away. As it reaches the vulva, the patient should be told to cease her efforts, and the midwife should twist the after-birth round and round on itself, eighteen or twenty times, gradually withdrawing it at the same moment. This is to wind the membranes, or bag which held the water into a string, if possible, inside the vagina, and perhaps the uterus, so that they may all come away with the placenta in safety. The mass, when removed, should be laid away for subsequent careful examination, in order to determine whether any part has been left in the mother, as the effects of such an accident are much to be dreaded.

Contracting the Womb.—The attention of the midwife should be, however, immediately returned to the mother, and her hand at once applied again over the abdomen, when the womb ought to be felt as a ball of some three and a half inches in diameter, or about the size of the new-born baby's head, and even harder than before. If not so felt, firm pressure and friction over the abdomen must be made to induce it to contract. Should it not do so within a minute or two the midwife must introduce her hand up the vagina into the cavity of the womb, under strictly antiseptic precautions, and pulling out the clots of blood she will probably find there, strive again to excite the womb to its proper contraction.

To Prevent Flooding.—Should these efforts prove unavailing, not a moment is to be lost, for the next five minutes will perhaps cost the patient her life by flooding. Let, therefore, a piece of ice, a sponge dipped in vinegar, or a peeled and gashed lemon, be carried up with one hand and rubbed around inside of the womb, whilst the other hand of the widwife, by firm pressure and friction over the patient's abdomen, contributes to stimulate that uterine contraction in which lies the mother's only safety. Or a teaspoonful of ergot, repeated in fifteen to twenty minutes. As soon as this is accomplished, as it probably will be by these remedies, a tight bandage should be pinned around the patient's body, with two or three folded napkins beneath it, pressing upon the part of the abdomen over the womb, to prevent relaxation, which happily seldom occurs when thus treated.

Making the Mother Comfortable.—After being securely bandaged, the patient may be lifted up a little, out of the wettest part of the bed, if it can be done without any effort on her part; but for fear of flooding, the more quiet the parturient is kept for the first two hours after labor, or until the blood has had time to clot firmly in the large, open-mouthed veins of the uterine cavity, the less is her danger. When the patient is made as comfortable as possible, a clean napkin, loosely folded, is to be placed between the thighs, but not pressed up tightly against the vulva, lest it act as a plug and prevent the detection of flooding, should that come on.

Should the Child Not Cry.—In case the child does not cry when first born, its mouth should be carefully cleared of mucus and other obstruction, and a little cold water sprinkled upon its breast. Should this fail in rousing a gasping effort at breathing, the baby, still attached to the cord, if that is pulsating, should be put into a basin of very warm water, and after a minute or two, when the surface of its body is well heated, the dash of cold water over its face and breast again tried. If still unsuccessful, the baby should be wrapped up in hot flannels, and artificial respiration, by blowing into the mouth whilst the nostrils are held, and then forcing the air out by compressing the chest, attempted as a forlorn hope. The writer has found the results of dry heat, applied by cautious roasting before a fire, promising enough to warrant further employment in otherwise hopeless cases.

Baby's First Bath.—If, on the contrary, the child cries lustily, and the mother is doing as well as can be expected, the cord should be again examined to verify the fact of its being securely ligated, and the baby given its first bath. The infant should be rubbed all over with lard, to soften the *vernix caseosa* or cheesy matter with which it is more or less covered, then well washed with white castile soap and milk-warm water and thoroughly dried.

Dressing the Navel.—The cord is dressed by being drawn through a hole cut in the middle of a piece of soft old linen, folded once, and trimmed to four inches square, and after being wrapped in this is laid upward on the baby's stomach, and bound in place by a belly-band of silver flannel, fitted snugly but not too tight, and secured by safety-pins or a few stitches.

Of the Wrong Presentations.—The management of labor when the back of the head does not come down first, and especially when the buttocks, feet, or arms present, is so apt to be difficult and dangerous that a physician ought always to be summoned, even from a great distance and at the utmost inconvenience, should any signs of a "cross-birth," as it is popularly called, be detected, or should unusual delay in delivery render obstruction probable. It will sometimes be a comfort to a woman in labor who is anxiously awaiting the physician's arrival to be reminded that if the birth comes before the doctor it will be because everything is all right, whilst on the contrary, if there be anything wrong, the physician will usually have ample time to reach her before his services are actually needed.

After-Management of Labor.—The management after labor should be such as will best avoid any excitement, either mental or physical, liable to light up inflammatory action in the womb, which has just been the subject of such momentous change. The patient, in ordinary cases, ought to remain in bed until the twelfth or the fourteenth day, partaking of semi-solid food until the third day, when the bowels should be moved. For this purpose she may be given a bottle of the citrate of magnesia in two doses, one-half hour apart, salts or an enema. After the bowels have been thoroughly moved, solid food should be given. She should not receive company for at least three days, but devote all her energies to the task of recovering as speedily as possible, both on her own account and for the sake of the frail, new life so utterly dependent upon her care.

PUERPERAL DISEASES.

Character.—The puerperium, or the puerperal stage, is the two weeks following the birth of the child. It begins immediately upon the expulsion of the placenta.

Among the diseases of the puerperal state may be mentioned after-pains, which, though seldom troublesome subsequent to first deliveries, may in others cause more suffering than the labor itself.

Treatment.—They can, however, be greatly relieved by the use of ergot just as delivery is accomplished, and of one-half grain opium suppositories, or forty-drop laudanum injections, or a Dover's powder, in two or three hours if they persist.

Sore Nipples.—Soreness of the nipples and cracked nipples are very apt to come on in patients with tender skins from the constant irritation of the baby's gums in nursing, and are unfortunately very difficult to heal, because the same irritation which originated the trouble in the first place is continually kept up.

Treatment of Nipples.—Vaseline, zinc ointment, laudanum and nitrate of silver sometimes succeed in curing the sore, but the most successful plan is to use a wooden shield with a rubber nipple if the baby can be persuaded to consent to the innovation. Women who suffer in succeeding pregnancies from this condition may do much to prevent its recurrence. About three months prior to the expected date of confinement rub the nipples night and morning with cocoa butter and expose them several hours daily in the sunlight. Before and after nursing the nipples of the mother and the mouth of the baby should be washed with a solution of a teaspoonful of boric or boracic acid in a tumblerful of water. The nipples should be thoroughly dried.

Danger of Cracked Nipples.—The great danger of cracked nipples is that it may lead to abscess of the mammary glands (the so-called gathered breasts).

CHILD-BED FEVER OR PUERPERAL FEVER.

Character.—Puerperal fever is a very dangerous disease, which is invariably due to a lack of antisepis. All cloth or napkins that come in contact with the vulva of the woman which have not been boiled, the hands of those attending to her unless thoroughly washed, all instruments used unless rendered aseptic will carry dirt of some kind, giving rise to this condition, which, practically speaking, is blood poisoning.

It generally comes on or about the third to the fourth day after delivery with a violent chill, great thirst and extreme prostration.

Symptoms.—The uterine discharge, or lochia, which should persist for ten days to two weeks, becomes very foul, the odor of which is nauseating, or it quickly dries up.

The fever may run very high, and diarrhœa with obstinate vomiting may set in. The mind soon grows clouded, if the attack be a severe one, muttering delirium makes its appearance, and the patient often dies on the third to the seventh day of the attack in a condition similar to that observed in typhus fever.

Treatment.—A large majority of the cases prove fatal, but full doses of twenty to thirty grains of quinine, with one-thirtieth grain of strychnine sulphate every two to three hours, succeeds in saving a small proportion of the cases. If an abscess forms, be it in the pelvis, or elsewhere, it should be incised and drained. Cold sponge baths every two to three hours will reduce the fever, and an ice bag to the head will oftentimes prevent brain complications.

Puerperal Mania.—This is a form of insanity liable to come on a week or ten days after confinement, in which there is frequently a singular aversion to the child, and perhaps to the husband also. A tendency to suicide is also prominent, and patients thus affected should be watched with the most unremitting care. Under perfect rest, nourishing diet, moderate stimulation and sedatives persons generally recover.

Puerperal Convulsions.—These may come on before or during labor, as well as in the month following delivery. They are generally due to accumulation of urea in the blood, the consequence of temporary Bright's disease, resulting probably from the pressure of the uterus containing the fetus upon the kidneys. The treatment has already been pointed out under the head of uremia.

Milk-Leg.—This is an inflammation of the lymphatics of the limb, coming on especially toward the end of the second week after labor and deriving its name from the milk-white appearance usually presented by the skin of the affected part. As the febrile state of the system is apt to cause drying up of the milk, it was formerly supposed that in some mysterious way the lacteal fluid was transferred to the leg. At first it may be quite painful, but after the integument becomes accustomed to distention, the sensations are rather those of weight and discomfort than of positive suffering. The treatment is by laudanum or turpentine fomentations at first, and later with stimulating and anodyne liniments, which hasten a little the naturally tardy convalescence. The ordinary duration of the affection is from a month to six weeks.

MANAGEMENT OF THE INFANT.

Suckling the Baby.—After a baby has received its first bath, and been for the first time introduced to the mysteries and miseries of clothes, it should be put to the breast for the purpose of extracting whatever nourishment nature has there provided for it, and also as the commencement of its education in the art of nursing, a business upon which its life for some months will depend. Curiously enough whilst some children take hold of the breast as if by instinct, others must be taught to nurse, and show for this vital operation all the perverse unwillingness of Shakespeare's schoolboy, notwithstanding it is the one thing in the world they have to do.

Mother's Milk the Best.—Every mother ought, if possible, to suckle her own infant, not only for her own sake but for that of the child. Statistics show that babies nursed by their mothers, amid the unfavorable surroundings of prison life, thrive better than those who are brought up by hand in healthy country districts outside, and no woman in good health, who can furnish the nourishment, should be spared the reproach of risking the life and health of her offspring if she refuses to perform her maternal duties in this regard. A mother undertaking the suckling of her infant should, moreover, do so with a mind fully alive to its importance, and with a firm determination that no pleasures of society or of fashion shall interfere with its conscientious performance, or else she had better not attempt it at all.

Amount of Breast Milk.—The amount of milk contained in the breast, especially with the first child, is very small for two or three days, but in some forty-eight hours the rush of milk, as it is called by nurses, commences, and is often attended with some fever, and marked pain and soreness in the breasts. The remedy for this disturbance in the mother's system is, however, very simple and conveniently at hand, and as the child, which, if healthy and vigorous, generally has a good appetite, draws out the milk which nature has provided for its special benefit, all these uneasy sensations soon subside. If the coming in of the milk is unusually delayed, it may be necessary to give the baby a little cow's milk, well diluted and sweetened with sugar of milk; but this is seldom required.

Mothers to Avoid Excitement.—During the time a mother is nursing her infant every care should be used to avoid any violent mental excitement or shock, which is exceedingly apt to influence the secretion of the mammary glands to a certain extent, just as it does that of the lachrymal gland, and render the lacteal fluid temporarily unwholesome or poisonous to the infant; or it may completely suppress the secretion of milk, with very serious consequences to both the parent and her offspring.

The Wet Nurse.—If, for any reason, the mother is unwilling or unable to suckle her infant, the next best chance for the baby's life is to procure a good wet nurse. When such an alternative is adopted, great care should be exercised in selecting the foster-mother, and the physician's advice ought always to be obtained upon this important subject.

Bringing Up by Hand.—Should the mother fail to nurse her child, and no good wet nurse is procurable, the child must be brought up by hand, a species of manipulation which contributes, it is probable, more than anything else to swell the lists of infant mortality in most large cities, as well as to some extent in country districts. Although goat's milk is used occasionally in this country as an infant's food, practically the choice is narrowed down in most cases to cow's milk, and the great object should be to secure this from healthy animals, pure and free from all admixture, as pointed out in an earlier chapter upon milk as an article of diet, and in a perfectly fresh condition.

Testing the Milk.—All milk used for the feeding of young infants, especially in the summer, should be carefully tested, and particularly in regard to its acidity, with litmus paper. If found to be acid it ought to be at once rejected, and a sample of pure, sweet milk obtained.

Putting Baby to the Breast.—A new-born infant is not hungry, consequently it need not be put to the breast for three or four hours or more. This will also give the mother a chance to obtain a little needed rest. For the first twenty-four to thirty-six hours the baby should be put to the breast every four to six hours. The subsequent twenty-four hours about every three to four hours. About the third day or so, when the milk is well established, the baby should be nursed every two to three hours.

Time for Nursing.—Under no consideration nurse the baby between 11 P. M. and 5 to 6 A. M. If mothers would only institute this from the time of birth, both she and the baby will obtain a good night's sleep. Should the baby awaken, change its position, and give it a little water to drink, and invariably it will go off to sleep. Another bad practice is to give the baby the breast every time it cries, in order to quiet it. It should be conquered from the beginning, so do so.

Weaning the Child.—The time for weaning, generally about the age of nine months, should be determined partly by the growth of the teeth, presuming, of course, that the mother's health is not suffering in the meanwhile. When the first lower middle incisor teeth appear, which usually happens about the sixth or seventh month, the mother may begin to diminish the number of times for suckling more rapidly, at the same time replacing the breast milk, of which the infant is deprived, by cow's milk thickened with oatmeal, barley or wheat flour, and so forth. After the child has four teeth it should be weaned, although if the infant is feeble, or the season unfavorable, the period of nursing may be extended a few months longer.

Dilution of Milk.—If the new-born baby is not nursed and fresh cow's milk is employed, it should at first be diluted with half its bulk of pure, tepid water, sweetened with a teaspoonful of sugar of milk to one-quarter of a pint of milk, and a few grains of salt. Condensed milk will not require sweetening, but should be freely diluted so as to resemble human milk in color. For the first month of a child's life it may be mixed in the proportion of one part of the condensed milk to ten or twelve of warm water.

Cleanliness of Nursing Bottle.—The most rigorous cleanliness of the nursing bottle and nipples must be insisted on, and under no consideration should the long rubber flexible tube apparatus be employed. It is an exceedingly dirty arrangement, as it cannot be properly cleaned. Simply use a very plain bottle, keeping the nipples in a soda solution.

Foods Other than Milk.—When a child does not seem to thrive well upon pure or diluted cow's milk, it has often been advised to resort speedily to mixtures of milk with meat broths, raw eggs, and so forth. Bretonneau reported, as early as 1818, that when children under his care who were suffering with tabes mesenterica, were fed with milk and meat broth, they rapidly improved, and other authorities recommend this mixture as the next best thing to woman's milk.

EXTRA UTERINE PREGNANCY.

This constitutes a pregnancy occurring in the oviduct and not in the cavity of the womb.

Symptoms.—1. The woman will have all the symptoms of pregnancy. A pregnancy of this kind invariably follows a long period of sterility. The woman who has previously menstruated regularly will miss a period and consult a physician. If he examines her to ascertain the cause of the stoppage of the flow, and this variety of pregnancy is present, he will find the uterus very slightly enlarged and a mass to one side of it.

2. About four to eight weeks, as the fetus continues to grow, the distended tube may rupture, or the contents may be expelled through the end of the tube (tubal abortion).

3. If the tubal abortion or rupture occurs, the woman will first notice a sudden, sharp, severe pain in the abdomen. This will be followed by fainting spells which may or may not end in death, due to the loss of blood.

Treatment.—If the condition is recognized prior to rupture, the woman should submit to an operation at once, before rupture takes place, which accident invariably terminates in death.

If the woman is not seen by a physician until rupture does occur she should be operated on at once, in order that the bleeding vessels may be tied. In a few rare cases nature checks the bleeding, which will be followed by a second rupture, usually with fatal results.

GENERAL RULES FOR MOTHERS ON MANAGEMENT OF INFANTS.

Washing and Dressing.—The new-born infant, while it is being washed and dressed, may have some butter and sugar given to it, though this food is by no means absolutely necessary, unless the infant cries, and it may be applied to the breast when there is milk, in half an hour or an hour after delivery, or as soon as the mother has recovered from the fatigues of parturition.

Suckling.—The infant ought to be applied to the breast every two hours, or as often as it awakes from sleep. Lactation or suckling generally prevents sore breasts and nipples.

Wet-Nurse Diet.—A wet-nurse ought to avoid spiced, salted, smoked, and oily animal substances, and also crude vegetables, pickles, unripe fruit and spirituous or vinous liquors, unless when delicate.

Best Drinks.—Light broths, milk, whey, coffee, home-brewed ale, stout or porter, are the best drinks, and a pint or a pint and a half of the two last is sufficient during twenty-four hours.

Tea and Coffee.—Tea and coffee may be used moderately.

Conduct of Wet-Nurse.—A wet-nurse ought to attend most closely to the infant committed to her care, and avoid all crowded assemblies, balls, theatres, etc.

Temper of Wet-Nurse.—A hired wet-nurse ought to be healthy, good-tempered, careful, fond of children, watchful at night, patient, sprightly, cheerful, active, have a good supply of milk, and a healthful infant of her own.

Treatment of Wet-Nurse.—She ought to be treated most kindly by parents who intrust their infant to her care.

Substitute for Human Milk.—The best substitute for human milk is that of the ass or cow, with a sixth part of tepid water and some loaf sugar. Three tablespoonfuls are sufficient for each repast for a new-born infant. Asses' milk has a decidedly sedative effect.

Boiled Milk.—The milk should not be boiled or repeatedly heated. The inferior animals of the mammiferæ are nourished with milk only.

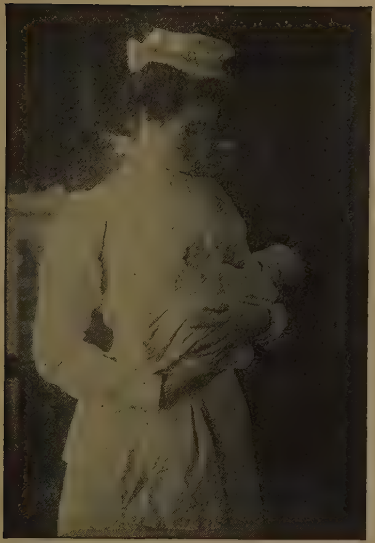
Warmth.—The infant ought to be kept warm, clean, and changed whenever it wets or soils itself, and in such cases dried or washed and powdered, and a clean napkin applied.

Hunter's Rule.—John Hunter well observed, "give children plenty of milk, plenty of sleep and plenty of flannel."

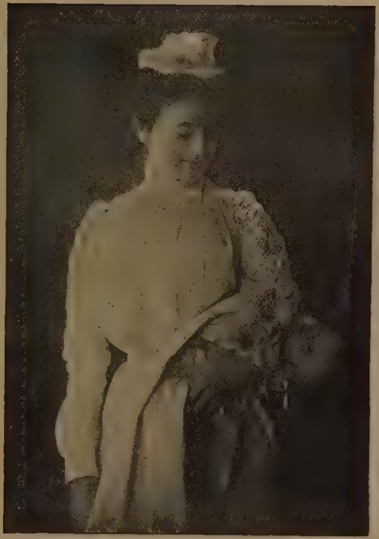
Cereal Foods.—Farinaceous aliments ought to be used sparingly at first, and mixed with milk. They are most appropriate before the time of weaning.

Weaning.—Ablactation or weaning may be accomplished when the infant is vigorous, after the appearance of the milk-teeth, which varies from the sixth to the twelfth month.

When Not to Wean.—Weaning ought not to be attempted when the infant is delicate, teething or laboring under any severe disease, as the



THE RIGHT WAY TO HOLD THE BABY.



THE WRONG WAY TO HOLD THE BABY.

FEEDING THE BABY.

HOW TO QUIET THE BABY.

breast is the best sedative for infants, even if the milk is deteriorated. It ought not to be commenced during winter.

How to Wean.—Weaning should be commenced gradually, and not suddenly, the infant being first accustomed to ordinary food; for in the last case it becomes fretful, peevish and rapidly out of health.

Consult Children's Likes.—Children have their likes and dislikes as well as adults, and ought not to be compelled to use any food which they disrelish. Light puddings, eggs, fresh fish, gravies, soups or broths mixed with arrow-root, mealy potato, bread crumb; ripe fruits, such as apples, pears, oranges, strawberries, grapes, etc., the pips or seeds being removed, may be used in moderation by infants from the second to the fifth year.

Proper Meats.—Boiled or roasted meats are best for children; fried, broiled, stewed or minced are less proper.

Regulation of Food.—Solid animal food is improper for young children, as they do not sufficiently masticate it, and it produces irritation in stomach and bowels. Too much food is generally given to infants, but they ought to be left to their own discretion or inclination as to the quantity.

Sleep.—The infant ought to be allowed to sleep and wake whenever it pleases. All violent rocking in chairs, cots or cradles is injurious to the brain and to the general health.

Position in Bed.—It ought to be placed on the right side in bed, to facilitate the passage of the milk or food from the stomach into the bowels. It may also be turned on the left side, and of all positions the back or face is the worst.

Clothing.—The clothing should always be suited to the season, so that exposure to cold and damp should be avoided. Exposure to cold and improper food are the most prolific causes of diseases of infants. It is computed that half mankind perish from cold before the end of the third year.

Air and Exercise.—Air and exercise in the nurse's arms, or in a carriage, or on foot, are as necessary for children as for adults.

How to Exercise.—An infant is exercised by being carried in the arms, rocked in a cot or cradle, by rubbing its body or limbs at the time of dressing or stripping, by dandling, by its laughing and crying, by riding in a carriage, by crawling, walking, jumping, running, dancing, and so forth.

Walking Period.—The infant finally acquires power to assume the erect position, to stand alone, walk along chairs, and so forth, when it ought to be carefully watched and assisted.

Place on the Floor.—It ought to be placed on the carpet, with its toys about it, when it will move about to collect them.

Danger from Falls.—It is now exposed to falls and injuries, which often destroy its life.

Cleanliness.—Cleanliness and bathing are essential to infants. Frequent washing with tepid water, either locally or generally, is highly beneficial. This is beneficial at all times, and indispensable in cold weather. Cold bathing is now universally condemned for delicate or feeble children.

Hardening.—Exposure to the air is necessary, but hardening, as it is properly termed, is most injurious, and often induces fatal inflammations of the respiratory organs. The clothing should *always* prevent the bad effects of the weather.

Teething.—Dentition or teething is a natural process, and unaccompanied by pain when the infant is in perfect health and properly managed as regards diet, clothing, cleanliness, sleep, air, exercise, and so forth. But it is in general a painful process, as few infants are properly managed or brought up by mothers or nurses, and very few are in good health.

Incision of Gums.—Incision of the gum over a projecting tooth is highly beneficial. Other diseases, which are sympathetically excited by teething, as cough, diarrhœa, and so forth, are to be treated on ordinary principles.

Vaccination.—Every healthful infant ought to be vaccinated after the sixth week, to prevent the danger and mutilations caused by small-pox, and too often death itself.

Kindness.—Children ought to be treated with kindness, and all corporeal chastisement avoided until reason is developed. "Spare the rod and spoil the child," is now an obselete maxim. Moral management is universally preferred by all enlightened individuals.

Severity.—Severity towards children is cruel and most injudicious. When correction is necessary, it should be inflicted with regret and gentleness, and never with a display of anger.

Jealousy.—A feeling of jealousy ought never to be allowed to exist between children; there should be no marked preference.

Diseases.—The infantine constitution is frail, and easily injured by external agents, and hence the frequency of diseases. The diagnosis of these complaints is difficult, as the sufferer cannot, in some cases, give any, and in others, a proper account of the symptoms.

Education.—Literary education ought not to be commenced until the age of six or seven years; but the nature and uses of external objects should be always explained to children.

Infant Schools.—Infant schools are very superior to the old-fashioned establishments, as they combine exercise, amusement and competition with instruction.

Picture Knowledge.—Much knowledge may be communicated by the representations of pictures or figures of birds, beasts, fishes, insects, herbs, trees, fruits and mechanical inventions.

Regard for Truth.—The utmost regard for truth, and abhorrence of falsehood, should be always inculcated.

Candor.—An open and candid disposition ought to be applauded, and an acknowledged fault rebuked with mildness and then forgiven.

Questions and Answers.—All questions put by children ought to be clearly answered, and the nature of surrounding objects explained to them correctly.

Behavior.—An affable, modest and polite behavior should be cultivated and applauded.

Memory.—The memory and intelligence must not be too much excited, as disease of the brain and bad health may be rapidly induced.

Prodigies.—Children who are prodigies in learning, music and other pursuits, are generally destroyed by premature disease in the brain, water in the head, and many other complaints.

Countenance.—They should be taught to maintain a lively and cheerful countenance.

Speaking.—Attention should be paid to a correct articulation and pronunciation.

Hurting.—They ought to be constantly cautioned against hurting themselves with surrounding objects, and the danger, pain, and bad consequences explained to them.

Treatment of Diseases.—The greatest judgment is required in treating the diseases of children, and medical aid ought to be procured whenever it can be obtained. The science and practice of infantile medicine require deep study and extensive observation.

CURATIVE MEDICINE.

PART X.

SKIN DISEASES.

This class of affections embraces diseases of the skin, hair and nails, and therefore includes maladies which occasion much distress and deformity, but are seldom dangerous to life.

Classes of Skin Diseases.—Skin diseases are easily recognized, but there is sometimes difficulty in distinguishing between the different forms. They divide themselves thus:

1. Those of an eruptive (erythematous) character.
2. The catarrhal, in which the conditions resemble those belonging to inflammation of the mucous membrane.
3. The vesicular, which is composed of small blisters.
4. The pustular, made up of pustules or small boils, containing pus or matter.
5. The papular, in which pimples appear, containing neither water nor pus.
6. The scaly eruptions in which the affected parts are covered with dry, whitish layers of epithelial cells.
7. Skin diseases caused by animal or vegetable parasites, of which the itch is a remarkable illustration.

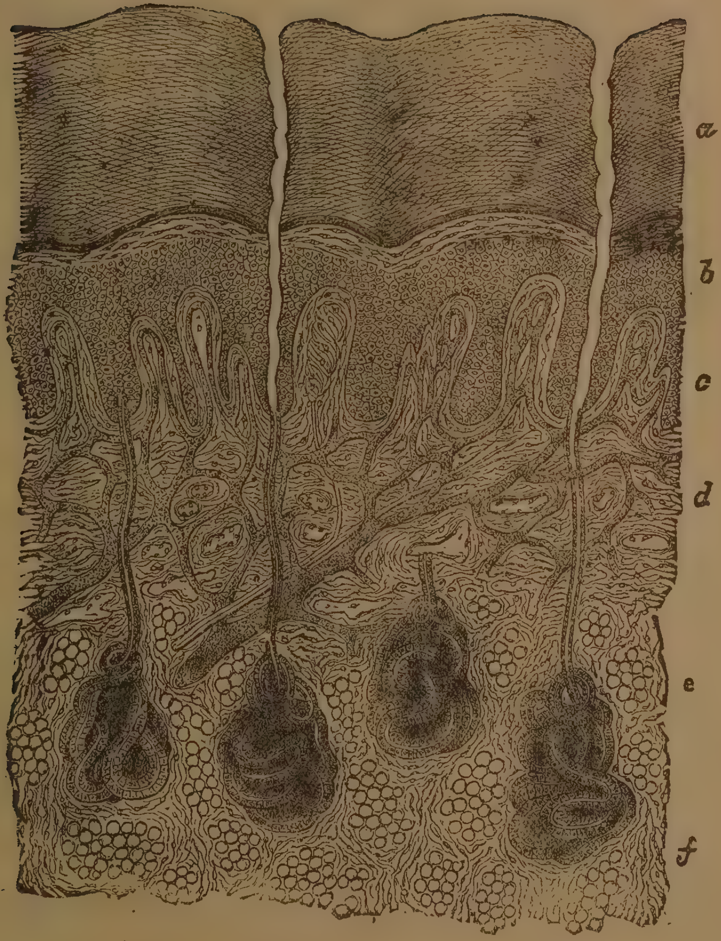
SKIN REDNESS (Erythema).

Symptoms.—Erythema is the name applied to the redness due to a superficial inflammation of the skin. It is the mildest form of skin disease, and is apt to affect fat people in hot weather. Infants are liable to be affected with it behind the joints.

Treatment.—See Nettle Rash.

NETTLE RASH (Urticaria).

Symptoms.—This is an eruptive affection which sometimes comes out quite suddenly, and is attended with a most troublesome itching. It is



THE SKIN.

a. Epidermis or cuticle.
b. Dermis or true skin.
c. Nerve prolongations.
d. Blood-vessels.
e. Oil cells.
f. Glands.

characterized by the formation of "wheals" or rounded patches of elevated skin, whiter than the surrounding parts, which are slightly reddened at the margins.

Causes.—It may arise from the bites or stings of insects; from the eating of certain fish, especially shellfish; or from reflex irritation, and other causes.

Treatment.—It is greatly aggravated by scratching, and, like simple erythema, is relieved by dusting with finely-powdered oxide of zinc and starch, with lycopodium, or even with rye flour. Lotions of lead water, benzoic acid and borax are also sometimes useful. If fish or other unwholesome food is the cause of the trouble, it must be got rid of by emetics and purgatives, and other causes of irritation should be sought out and corrected likewise

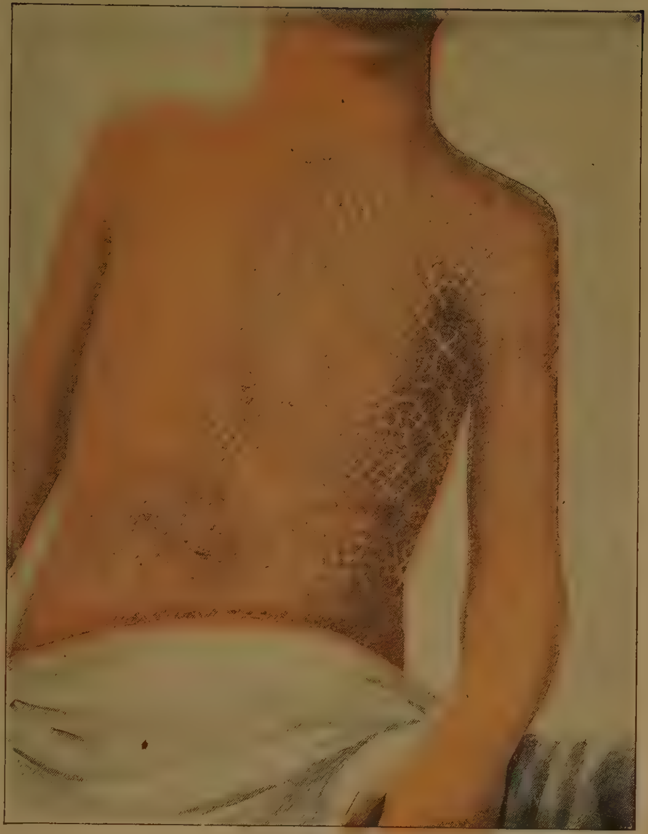
MOIST TETTER OR ECZEMA.

Symptoms.—Eczema, sometimes called moist tetter, is a catarrhal inflammation of the skin usually attended with a breach of surface. It presents at first irritable, raw, red patches, with occasional little blisters which soon break and a fluid is discharged, which in drying forms crusts or scabs. Later on the patches become dry, scaly, and often cracked. This is a form of skin disease which is often seen in young infants, in whom it sometimes receives the name of milk-crust. The pain, burning and itching of eczema are intense, and yet it is only aggravated by scratching. It is especially apt to appear about the flexures of the joints, as, for example, in the hollows of the elbows and knees.

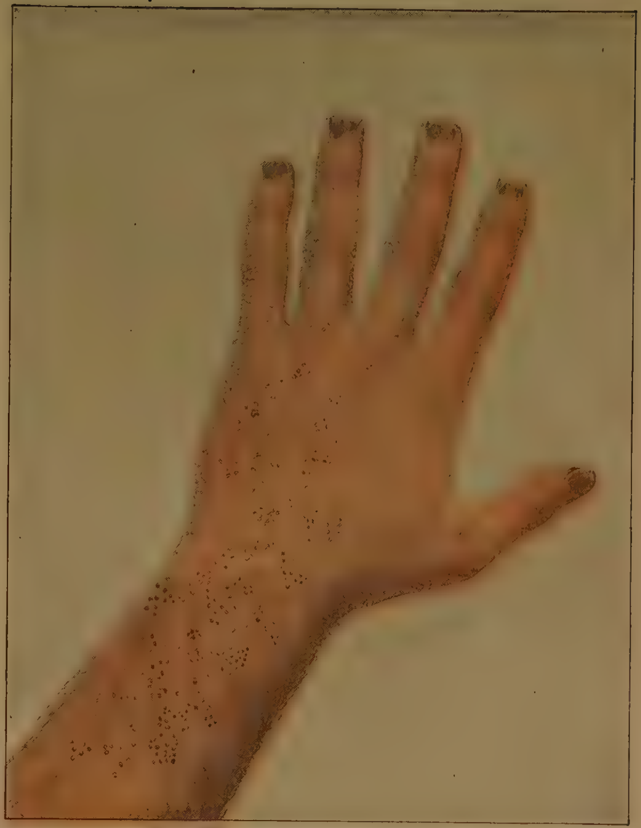
Remedies.—At first soothing lotions, such as lead water, and zinc, or camphor in fine powder with starch, do the most good, but later, ointments of the ammoniated mercury, or very dilute ointment of the red oxide of mercury, of, for example, ten grains of the oxide to an ounce of lard, are useful, and still later, when the skin is dry, itching and scaly, tar ointment may be resorted to. When of gouty origin eczema is apt to be benefited by the internal use of colchicum, and the other varieties often yield readily to arsenic, which may be given in the form of five drops thrice daily of Fowler's solution after the first acute stage has passed.

SHINGLES OR HERPES.

Symptoms.—Herpes, which is a good type of the vesicular affections of the skin, is characterized by little blisters which come out in small groups, and when appearing about the mouth and nose, constitute the cold-sores with which almost every one is familiar.



ECZEMA.
Scaly Form.



ECZEMA.
First Stage of Simple Eruption.

Shingles Proper.—A severe form called herpes zoster, or the "shingles," comes on with smarting and burning pain in a belt half way around the body of large patches of the eruption. It is distressing and tedious, often lasting a month or six weeks, but rarely dangerous. The popular idea that it will prove fatal if it goes all around the body is without foundation.

Treatment.—The only treatment is to apply anodynes and soothing lotions, such as the morphia and lead water recommended in erysipelas, and administer opiates to relieve the pain.

PEMPHIGUS.

Character.—Pemphigus is another vesicular eruption, characterized by the formation of large blisters, from half an inch to two inches in diameter, resting on slightly reddened surfaces, and mostly attended with severe itching. These blisters sometimes appear on the fingers, but commonly attack the lower limbs. They generally indicate a more or less impoverished state of the system, in which iron, quinine, strychnine and good nutritious food are called for.

Remedy.—Arsenic is also very useful, and locally soothing ointments or absorbent powders may be employed.

PUSTULAR ERUPTION (Impetigo).

Character.—Impetigo is the most common of the pustular eruptions, and is characterized by the formation of separate pustules, somewhat like those of small-pox. They may attack any part of the body, but are most apt to appear upon the face and limbs. This disease, like ecthyma, which in many respects it resembles, seems as if it were an aggravated form of impetigo, and is especially frequent among children, although adults are not exempt. Ecthyma is always associated with general debility, defective nutrition, or hygienic neglect.

Remedies.—The treatment is by good food, tonics, with cod-liver oil, and strict attention to cleanliness. Soothing applications, such as Goulard's cerate, should be made first to the pustules, but later on a very mild mercurial ointment is more effectual.

BOILS.

Causes.—Boils, those common and exceedingly troublesome inflictions upon mankind, are classed under the head of pustules. With all the advances we have made of late years in pathology, the cause of boils still remains undiscovered. Sometimes they seem to be due to high living, and in other cases poor diet appears to determine the advent of a troublesome series of these parts. One boil is very apt to precede a crop of fifteen or twenty, although there is no certainty that this will be the result.

Treatment.—1. The best way of managing a boil is to poultice it with flaxseed or bread and milk, containing laudanum to ease the pain. If the boil is small, the poultice may be spread upon a piece of oiled silk, which prevents it from becoming dry, and held in place by a bandage, or by a square piece of linen upon each corner of which has been daubed a little spot of adhesive plaster, the stick of plaster being melted in the flame of a candle for the purpose. This holds a dressing of any kind on a broad, flat surface of the body, as, for instance, the skin of the back, very satisfactorily.

2. When the boil softens in the centre, and the fluctuation of matter can be detected, or its yellowish color can be seen under the skin, some twenty-four hours of suffering may be saved by having it lanced, and the pain of the cut may be abolished by freezing the surface with ether spray, or by stroking it with a little bag containing a mixture of ice and salt. In certain cases it is important to lance a boil early, so as to prevent the burrowing of the pus toward some important structure; but ordinarily, if the sufferer dreads the knife, there is no actual necessity for using it, and the boil may safely be left to break of its own accord, under the poultice, one, two or three days later than the time when it is ripe for lancing.

3. Lancing the little pimple, with which a boil first commences, exactly through the middle, which can be done almost painlessly under the ether spray, will nearly always cut short this troublesome affection. Ten or twelve grains of quinine daily, so as to produce slight cinchonism for a week, occasionally breaks up a course of boils, but is by no means an infallible remedy.

CARBUNCLES.

Character.—Carbuncles chiefly differ from boils in the larger area involved in the inflammation, from which a core of dead connective tissue, called a "slough," several inches in diameter, may come away. Carbuncles are apt to come on the nape of the neck, and on the back, but may appear on any part of the body. A large carbuncle will sometimes keep a patient in bed for a month or six weeks, and the pain and exhausting discharge wears out the strength so much that it may cause death; if a second of large size appears, after the first begins to heal, as it is not very unusual, it quite frequently proves fatal.

Treatment.—Poultices of flaxseed meal, bread and milk, powdered slippery elm bark, or of yeast; anodynes to relieve pain; and six grains of quinine daily, with other tonics to support the strength, constitute the appropriate treatment. Early and free incisions into the inflamed tissue, made after freezing the part, are probably of great service.

PIMPLES.

The papules or pimples are solid elevations of the skin, containing neither water like the vesicles, nor pus like the pustules. They are three in number, including strophulus, the red gum or tooth-rash peculiar to infants, lichen or prickly heat, and prurigo.

Strophulus.—This consists of an eruption of innumerable small, reddish pimples, which occur for the most part on the face, neck and arms of young children. The irritation and general disturbance is slight. The eruption is usually caused by digestive derangement of some kind, as, for instance, that of cutting a tooth, and passes away with the cessation of its cause.

Treatment.—The only treatment necessary is some mild, saline laxative, and a lotion of very weak solution of carbonate of soda, five or ten grains to the ounce, with a teaspoonful of glycerine, to allay the itching if that appears to be very troublesome.

Prickly Heat or Lichen.—This is very common in hot weather, in the simple form of reddish pimples, which itch a great deal but usually subside on the approach of the cooler season. It sometimes takes on a severe form, and may even become chronic.

Treatment.—In mild cases tepid baths, plain and easily digested food, an occasional saline laxative, with a tablespoonful of infusion of gentian, and five grains of bicarbonate of potash or soda internally, three times daily, will effect a cure. To relieve the itching, solutions of borax, vinegar or carbolic acid may be used with advantage. In aggravated cases the more powerful tonics, with tablespoonful doses of cod-liver oil and one-sixteenth of a grain of arsenic three times a day must be resorted to.

Prurigo Symptoms.—This is characterized by an eruption of pale, slightly elevated pimples, mostly situated on the trunk of the body, and attended with very intense irritation, especially at night, so that the marks made by the patient's nails in scratching can almost always be seen, and aid in recognizing the malady. It is frequently the result of the presence of the vermin with which so many dirty people are infested.

Remedies.—Cleanliness, by the aid of strong alkaline baths, and the use of an ointment of carbolic acid, or of white precipitate, with the administration of tonics and good food will generally effect a cure. Sometimes, however, the disease, unless it is carefully treated early, proves very obstinate, being kept up in great measure by the constant scratching, which it is very difficult for the patient to abstain from.

TETTER (Psoriasis).

Character.—Psoriasis is the most important scaly eruption; in certain of its varieties it probably constituted one form of the leprosy of the Bible. It is characterized by the appearance, at first, of oval or rounded patches of slight irritation, then upon these an eruption of scales, which grow dense and white toward the centre. Afterward the spot expands from its outer edge, where the skin is often reddened and slightly raised above the level of the surrounding surface. This is the skin disease to which the name of "dry tetter" is commonly applied. In the worst or inveterate form, the whole body may be covered with these white scales, except the face, the palms of the hands and the soles of the feet. Even these do not always escape. The incrustation of scales in this variety of psoriasis is thick and dense. When it has lasted for some time the skin chaps and breaks, after which there is severe soreness with exudation of fluid from the broken surface, intense irritation and itching, with great general and physical exhaustion, lasting for many weeks, or perhaps months. In rare cases it may even prove fatal. In the milder form, it is especially apt to appear very symmetrically upon the knees and elbows, and is most common between the fifteenth and twenty-fifth year of life. It is prone to recur in a patient who has once manifested it, but is not contagious. Often it is hereditary, and may be associated with a gouty or rheumatic taint in the system.

Treatment.—The treatment consists of careful attention to diet, avoidance of alcoholic stimulants, and the administration of arsenic in the form of Fowler's solution, five drops thrice daily. Externally soothing lotions or ointments are required in the first stage, and mild mercurial or tar ointments are of service after it has become chronic.

SCALP DISEASE (Pityriasis).

Character.—Pityriasis is a squamous disease especially apt to affect the scalp when it appears in the milder form, giving rise to the shedding of an immense number of bran-like scales, resembling an exuberant crop of dandruff.

Treatment.—Frequent washing, with the use of a borax lotion, or white precipitate and tar ointments, will generally remedy the trouble. A rare variety of pityriasis, affecting the whole body and generally proving fatal when in the chronic form, is also described.

The skin diseases dependent upon syphilis have already been detailed, and those of scrofula are chiefly of the types above mentioned, aggravated by the taint existing in the system.

WARTS, CORNS AND BUNIONS.

Hypertrophies of the skin are all unusual diseases, except warts and corns, which are common enough to make up for all the rest. The coming and going of warts on the hands is as much a mystery now as in former ages, when the most ridiculous remedies were gravely prescribed.

Wart Remedy.—Warts can be destroyed by caustics, of which nitric acid is the most severe and effectual, and chromic acid perhaps the least painful. When arising from the poison of syphilis, they are sometimes extremely sore and troublesome, so much so as to require removal by surgical operation.

Causes and Treatment of Corns.—Corns are similar to warts in their structure, except that they have a much thicker layer of epidermis over their surface. They are almost always produced by the pressure of tight shoes, and may be avoided by caution in this respect. They can usually be prevented from giving much trouble by carefully trimming out the centre of the corn at short intervals, or by wearing one of the various forms of perforated corn-plasters in common use. In cutting corn, the incision should never go through the epidermis, so as to cause bleeding, since dangerous inflammation has thereby been set up. Often filing a groove across the top of the corn with a coarse, half-round file, answers every purpose, and is not attended with any risk.

Bunion Treatments.—A bunion is generally made up of a corn on the side of the great toe, and an irritated synovial sac or bursa beneath it. It is also the result of wearing too tight a shoe, especially such as are too narrow at the point. When inflamed, it should be soothed with lead water and laudanum; a loose shoe, or one with a piece cut out of the side, being worn. After the reduction of the inflammation, benefit may be obtained by painting with tincture of iodine. A bunion should never be neglected, as it is liable to suppurate, leaving a troublesome indolent sore, which may for years cripple the patient, even if permanent lameness does not result.

ITCHING (Pruritus).

Character.—Pruritus is a very common disease of the skin, which is characterized by itching without any eruption or other apparent change in the appearance of the part affected. Children and elderly people are particularly apt to suffer thus, and the localities involved are generally those about the orifices of the body.

Causes.—Sometimes, like prurigo, it may be traced to the irritation caused by vermin, usually the pediculus corporis or body-louse, which may be gotten rid of by attention to cleanliness and the application of weak mercurial ointment, a tincture of lark-spur, or various other home remedies. When not thus produced, the cause must be sought in some deterioration of the general health.

Treatment.—As local applications, lotions of borax, half an ounce to the pint, or of carbolic acid, one or two teaspoonfuls to the pint, and ointments of zinc with camphor, belladonna or morphia are useful.

FRECKLES.

Freckles consist of a deposit of oxide of iron from the blood, just beneath the epidermis or in its lower layers. They may often be dissipated by painting with tincture of iodine, or by a cautious use of the weak solution of nitro-muriatic acid.

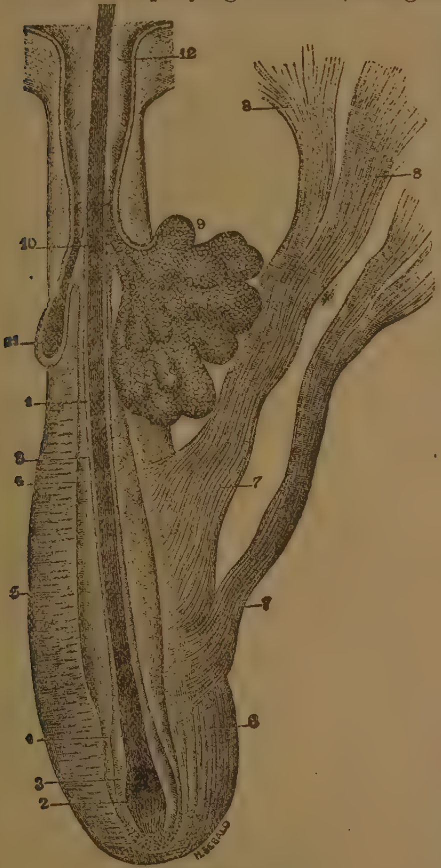
DISEASES OF SKIN GLANDS.

Seborrhea.—In seborrhea there is an excessive production of secretion, made up of oily matter and cast-off epithelial cells, which accumulates upon the surface in the form of thin, yellowish scales. It is especially common on the skin of young infants.

Treatment.—The layers of scales may be removed by the use of white castile soap and warm water, and if there is no inflammation of the skin, a mild carbolic or white precipitate ointment may be used to prevent their return.

Flesh-worms.—Acne, commonly called pimples or flesh-worms, coming, as it does, upon the face just at the time when young people of both sexes begin to feel most anxious about their personal beauty, gives rise to a far greater amount of unhappiness than many of the serious maladies to which flesh is heir. It is an inflammation of the sebacious glands of the skin upon the face and back, and elsewhere, which comes on in successive crops, and gives rise to the spotted and pimply countenances which are often so unsightly or even repulsive.

Description.—These sebaceous glands, one of which is well delineated in the accompanying wood-cut, are generally situated, as there indicated, by the side of a hair, and if inflamed, caused by the pressure they exert when distended, an inflammation of the surrounding derm constituting the pimple of acne. In the figure is exhibited a hair in its follicle, highly magnified. At 7 and 8 appear the curious little muscles which have the power of erecting the hair in conditions of sudden fright or horror. They are, as is well known, much more active in animals—for instance, the cat—than in mankind. 9 and 10 indicate a large, and 11 a small, sebaceous gland, both opening on the skin by the side of the shaft of the hair at 12. The small, black spot generally visible near the centre of an acne pimple is popularly supposed to be the head of a flesh-worm, which can be squeezed out by pressure at the sides of the papule. In reality, however, the yellow thread which looks like the body of a worm, is only the hardened secretion of a sebaceous gland, the top of which, being exposed to the air, has collected dust and dirt, and so become black.



A Magnified Sebaceous Gland.

Treatment.—No advantage is gained by squeezing out these little plugs of fatty matter, as in most cases the bruising of the parts more than compensates for any benefit afforded by the relief of internal pressure in the pimple from retained secretion. A great many local applications for the cure of acne are offered for sale, some of which are composed of powerful poisons, and are liable to do great and permanent injury. A safe and often useful lotion is made of precipitated sulphur, variously combined with mucilage of sassafras-pith, glycerine and camphor; or an ointment of precipitated sulphur, with vaseline, a drachm to the ounce, or white precipitate with vaseline, half a drachm to the ounce, may be employed.

Accessory Treatment.—The most important part of the treatment is attention to any general derangement of health, especially of the digestive apparatus, or, in females, of the menstrual function.

Diet.—Errors in diet will often bring out a crop of acne, and articles of food which contain fried butter or fat of any kind, appear to be apt to have this effect. Pastry of all varieties, particularly mince-pie, buckwheat and other hot cakes, sausage, cheese and nuts should all be avoided, as well as spirituous and malt liquors in every form. Although the treatment and hygenic care, as thus advised, will generally diminish the activity of the eruption, they may not always effect a cure, and consolation must be sought in the fact that it seldom persists unless kept up by imprudence, after the period of maturity in the organism has been attained.

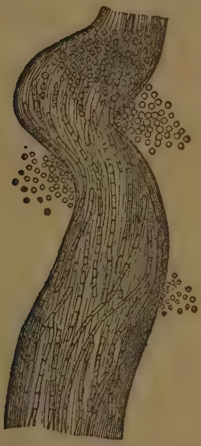
SKIN DISEASES DUE TO VEGETABLE PARASITES.

Causes.—It is now generally admitted that the fungus growths found so constantly in and among the epithelial scales of the epidermis are the causes, and not the mere accompaniments, of a curious group of skin maladies. The development of fungus not only invades the skin, but affects also the hair and the hair-follicles. Though the variety of vegetable growth differs in the different diseases, each presents the same general features, consisting of microscopic threads named mycelium, corresponding to the stem of a larger plant like a grape-vine, and microscopic seeds sometimes produced in bunches like grapes, and called spores. The full recognition of the fact, as it is believed to be by the present writer, that the fungous growth is the essential cause of the whole disease is vitally important, because upon it depends the system of preventing these maladies from spreading to healthy persons, by total destruction of the spores or seeds of the respective diseases.

A Case in Point.—In the instance of a member of the author's family, a little girl was infected with the fungus of Favus just underneath the tip of her chin, probably from spores left by some diseased child on the sill of a car window, from which she had been looking out, and at the time of being attacked with this complaint, which was fortunately recognized at once, and put an end to by appropriate treatment, she was in perfect health.

RING-WORM OF THE HEAD.

Symptoms.—Tinea tonsurans or ring-worm of the head is the most common of these vegetable parasitic diseases. It shows itself as a dry, scaly patch, rounded or oval in outline, which gradually grows larger and larger, the hairs dying and dropping out at the centre, so that ultimately a bald spot of from half an inch to two inches in diameter is left. The same fungus which produces this malady in the head sometimes develops among the hair of the beard, producing what is called tinea sycosis or barber's itch, and upon the other parts of the body where it is denominated tinea circinata or common ring-worm, with which, however, no worm has anything to do.


The Effect of Ring-worm on the Hair.

Further Symptoms.—Ring-worm of the scalp commences usually as a little pimple, which soon spreads and takes on its characteristic ring-like appearance, showing a circle of minute scales, pimples and vesicles at the circumference of the patch. As the disease advances the hairs included in the circle become dull, dry, twisted and easily broken off, whilst the epidermis and stumps of the hairs become covered with a greyish-white powder, consisting chiefly of the vegetable growth.

Illustration.—If one of these broken hairs is put into a drop of caustic potash solution, and examined under a high power, such as 250 diameters, of the microscope, its shaft can be seen as represented in the figure, penetrated with the mycelium of the fungus, called the tricophyton tonsurans, and floating around may often be detected separate spores of the same plant as indicated at the upper part of the woodcut on both sides of the hair.

RING-WORM OF THE BODY.

Tinea circinata, which is also denominated herpes circinatus and ring-worm of the body, begins like that upon the head with a small pimple, but soon spreads with great rapidity, and the rings of eruption may attain a diameter of four or five inches.

Characteristic.—The great characteristic by which this affection can almost always be recognized is its healing up in the middle, so that the appearance is presented, after a time, of a patch of healthy or slightly reddened skin, surrounded by an angry, red ring about a quarter of an inch wide. Such an arrangement of the eruption is peculiar to ring-worm and suggests that the fungus in its growth at the centre of the ring has exhausted some material found in the skin which is necessary for its development. Were this not the case it would almost certainly continue to flourish in the middle, as well as at the edges, so that the course of ring-worm affords a strong argument in favor of that part of the germ theory which supposes that the immunity conferred by one attack of small-pox, for instance, is due to the exhaustion in the entire system of some ingredient necessary to the growth of the specific small-pox fungus.

BARBER'S ITCH.

Character.—Tinea sycosis, or barber's itch, is the variety of the disease in which its vegetable cause happens to develop upon the chin of an adult, male patient. A great amount of irritation is usually set up, perhaps, from the roots of the hairs constituting the beard, extending more deeply into the substance of the true skin, and the plant therefore producing a deeper-seated inflammation of the parts as it grows down along the sides of the hair-follicles, than in the non-hairy portions. Hence large papules, and even pustules resembling those of acne in its aggravated state, are apt to be formed, and the itching and burning, as well as the disfigurement, are occasionally very troublesome to the patient. Perhaps among the vegetable parasitic diseases there is none to which persons are more liable to be exposed than this tinea sycosis or, as it is commonly called, the barber's itch.

Causes.—As before observed, any one of the innumerable epidermic scales, continually shed from human integument and constantly floating in the atmosphere around us, whence they are deposited with other materials in the form of dust, may be freighted with spores, or seeds enough of the fungus which causes tinea, to infect thirty, forty or fifty individuals should they meet with proper conditions for growth and reproduction. If persons fully realize this truth they can, of course, readily understand that all the ordinary precautions usually resorted to in barber's saloons, to wit, those of having separate cups, razors and brushes for each individual customer only diminish the danger of infection, and by no means insure a certainty of escaping the disease. For not only is the air of the room liable to carry separate epidermic scales, which may each convey the infection, but many of the operations connected with the process of shaving are still more likely to be the means of communication. For instance, the razors which are employed, even if they be individual property, are all sharpened with the same strap, upon which may have been spread, a few moments before you enter to be shaved, a few score epithelial cells from a case of tinea, one or two of which, should they accidentally adhere to the surface of your razor, as it certainly is quite possible for them to do, would be amply sufficient to implant the disease upon your face. In like manner the towels which are used, the brushes and combs, and even more certainly the hand of the barber himself, may prove the most efficient carriers of contagion which could possibly be devised.

Precautions.—In order to prevent the spread of these vegetable parasitic diseases the precautions already suggested must be rigidly enforced. All articles of clothing which have been worn in contact with parts of the body where the parasite grows should be purified by immersion in boiling water, or, if the nature of the material does not permit this, by baking at a heat of 250° Fahrenheit. All bed linen, bandages, brushes, combs and towels, or other articles suspected of similar contact, should be treated in the same way; and, of course, should be used by no other person until thus purified. The patient, if a child, should be kept by itself as far as possible, and those having charge of the case should thoroughly wash themselves after handling the parts affected. It is probable that the use of a strong carbolic acid soap, or of sulphite of soda or chlorinated soda solution would add to the security against attack, and with such precautions there is little danger that the malady will be transferred to others. Of course after proper treatment has once been put into operation, the danger of infection is still further diminished.

Treatment.—**1.** The essential point in treatment is to apply to the roots of the hairs a preparation which will kill the fungus, just as weeds are destroyed in an asparagus bed by sowing the ground with salt. In order to do this, the hair—if any exists—should first be removed, and the surface made as clean as possible. When the hair is not very thick, or has already been nearly destroyed by the disease, a cure may perhaps be effected by lotions or ointments of sulphuric acid, carbolic acid or salicylic acid. An ointment of verdigris is a favorite home remedy, and often succeeds after causing a good deal of unnecessary irritation.

2. Tincture of iodine, applied twice a day for fourteen days, and the spot then covered with the ointment of corrosive sublimate, of about two grains to the ounce, is an effectual method of treatment, which may be employed with great caution in obstinate cases. Where the hair is very thick and strong it is sometimes necessary to pull it out with tweezers, as will be directed in speaking of favus, although this severe operation is, happily, not often required.

SCALD HEAD.

Character.—Tinea favosa or favus, called also scald-head and honeycomb ring-worm, is characterized by its peculiar dry, sulphur-yellow crusts, in the form of little cups about a quarter of an inch in diameter. In advanced cases, however, these cups run together, so that their well-defined form can, perhaps, with difficulty, be recognized, except at the edge of a patch. A peculiar mouse-like odor is emitted from a child's head bearing a good crop of favus, this being probably produced by the spores of the fungus coming in contact with terminal branches of the olfactory nerve of the observer. On careful inspection, each cup is usually seen to surround a hair, and there is commonly little trouble in detecting the fungus spores and mycelia on microscopic examination.

Causes.—Although this disease is more frequently met with upon the heads of neglected, ill-nourished children than elsewhere, there is little doubt that any one of these spores of the achorion schœnleinii, as the fungous cause is denominated, might, under favorable circumstances, germinate and give rise to an abundant crop of favus in the hair, beard, or skin of the most vigorous individual upon whom they happened to be deposited.

In some cases the fungus of favus attacks the nails, developing beneath them and by the pressure which it causes producing their absorption and perforation. Much local inflammation about the root of the nail is thus set up.

Treatment.—The treatment of favus consists in removing the crusts by softening with a poultice, cutting or shaving off the hair, and then rubbing in thoroughly sulphur or tar ointment. If the spot is small a weak solution of corrosive sublimate may be painted over it, but this powerful poison requires very careful management. In obstinate cases it may be necessary to pull out the hair, either by the process of avulsion, where a cap made of adhesive plaster is suddenly torn off the head, bringing the hair with it, or by extracting six or eight hairs at a time with tweezers. This latter operation, called epilation, is denominated by Sir E. Wilson "the purgatory of avulsion," and condemned as little less cruel.

Brown Patches.—Tinea versicolor or chloasma depends on the growth in the epidermis of a fungus similar to that of ring-worm, but bearing its spores in heaps like bunches of grapes. The disease, which is seldom

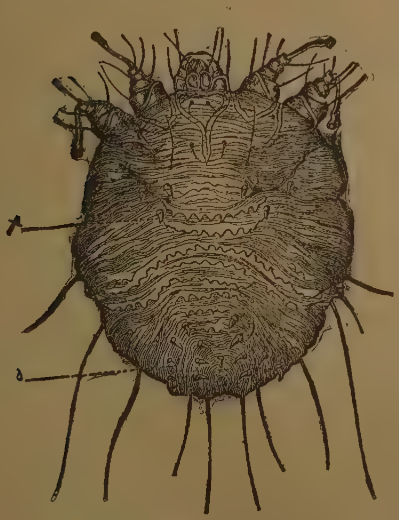
SCALD HEAD.

troublesome, is characterized by brownish-yellow, slightly scaly, irregular patches, which appear on the front of the chest and sides of the neck. It may also affect other parts of the body. As it does not penetrate deeply into the epidermis it is easily cured by painting with tincture of iodine, tincture of chloride of iron, or solution of sulphurous acid.

ITCH (SCABIES).

Causes.—Scabies or the itch, the most important skin disease caused by an animal parasite, was called in former times, when its true cause was but little understood, the seven-years' itch, because it was so hard to cure. At present it is universally admitted that the whole cause of this most annoying malady is the itch insect, or itch-mite, which is represented in the cut lower on the page as it appears under the microscope if magnified about two hundred diameters. From the irritation set up by the parasite, and still more from the scratching to which it drives the unfortunate patient, vesicles, pimples and pustules are formed and grouped together in every variety.

Symptoms.—1. The itching, which is terribly severe even in daytime, is generally much worse at night after becoming warm in bed. The favorite haunts of the insect upon its human domain are the hollows of the elbows and knees, the front of the wrist and the backs of the hands just between the roots of the fingers; but it is also found in other portions of the body where the skin is tender. The palms of the hands and the soles of the feet are not infrequently infested, notwithstanding the integument is thick in these parts. In a vast majority of cases showing discrete or separate eruption on the palms and soles it is due to either scabies or syphilis, and the presence of itching in the former and its absence in the latter of these two diseases enables us to distinguish them with great certainty.



The Itch Insect Magnified Two Hundred Times.

2. The accompanying eruptions of scabies vary somewhat in their character according to situa-

tion. Thus the prurigo of itch is generally best defined upon the forearms, the lower part of the abdomen, and the upper and inner portion of the thighs. A vesicular eruption is more frequent about the fingers and breats of thin-skinned people, and pustules are met with in children especially on the hands, feet and hips.

3. In searching for a specimen of the insect, which can be seen quite distinctly with a good magnifying glass, it is well to look for one of the pimples, which has, extending from it, a little whitish line about the eighth of an inch long and generally somewhat curved. This is the burrow of the female insect, in which she has laid her eggs and is raising a happy little family to follow her example and live off the fat of the land they inhabit. If the top of the burrow is scratched through very carefully at its outer end with the point of a fine needle, and then the tiny round dot which may be found there picked out on the needle and transferred to a slip of glass, positive evidence of the nature of the disease can be at once detected by suitable examination under a microscopic or hand-magnifier.

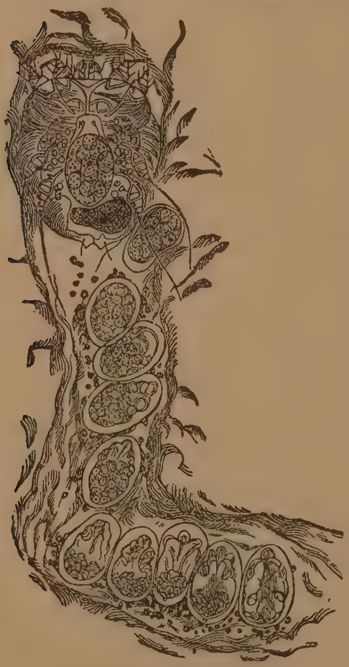

The Burrow of the Itch Insect.

Illustration.—The adjoining figure represents one of these burrows of the acarus scabies or itch insect, and in it is seen the mother of the family at the upper extremity, whilst eggs and young in various stages of development are depicted in different portions of the gallery excavated for their accommodation in the epidermis of their hospitable host.

Treatment.—The treatment of scabies should be by applications which, whilst they tend to kill the insects, will increase as little as possible the irritation of the skin. If this irritation is not already too great, the patient should go into a warm bath and scrub himself with brown or soft soap for half an hour; he should then lie in the bath for another half hour, and after being thoroughly dried, rub himself with the compound sulphur ointment all over, except the head, for twenty minutes, allowing the ointment to remain on the body all night.

This whole process should be repeated every night for three times, which will probably end the lives of the itch insects and so terminate the malady.

Disinfection.—In order, however, to avoid being reinfected from the clothing upon which some of the acari or their eggs may remain, every article that will bear washing should be thoroughly boiled, and those pieces of apparel which would be injured by water should be several times pressed with a hot iron, so as to completely destroy the parasites.

Further Treatment.—When the skin is very irritable the application of Peruvian balsam or the styrax ointment should be tried at first, and it ought to be remembered that even in those whose skins are not remarkably tender the sulphur ointment if used very vigorously is apt to produce an eczematous eruption, which, however, quickly subsides on the cessation of the application.

LICE.

Treatment for Lice.—The three kinds of pediculi or lice which infest the head, the body and the pubes of man, differ in their appearance under the microscope, being apparently each best fitted for the special part it has to play in tormenting the human family. They can all be defeated in this great business of their lives by strict attention to cleanliness, frequent bathing, and the application of mercurial ointment diluted with five times its bulk of lard. For the purpose of avoiding salivation, this ointment should not be used directly after a bath, nor rubbed in very strongly, nor, in fact, allowed to remain in contact with the skin any more than necessary.

CURATIVE MEDICINE.

PART XI.

DISEASES OF THE BONES AND MUSCLES.

Bones.—The skeleton is the framework of the body, and is composed of an articulated assemblage of hard organs, the bones.

It serves to preserve the shape of the body; forms cases for the protection of the vital organs, and gives attachment to muscles and forms levers of movement.

Number of Bones.—The number of distinct pieces or bones composing the skeleton varies at different periods of life. Some remain distinct from the first moment of their development, such generally being of the simplest form, such as the bones of the carpus or wrist, and the patella or knee cap. Others, which are viewed as single bones in the adult, not only consist of several pieces in the beginning, but in the progress of development have other pieces successively added, as in the case of the vertebræ or bones of the spine and the thigh bones.

May Unite Bones.—Again bones considered as distinct pieces when the body has arrived at maturity, at a later period may become united with those which are contiguous, as in the coössification of the cranial bones. Therefore in the adult skeleton the number of bones to which we usually refer are two hundred and six, exclusive of the teeth, and sesamoid and wormian bones, which are not uniform in number. Of this number twenty-six are found in the backbone or spine; twenty-two in the skull and face; the ribs count twenty-four, twelve on each side, whether the person be man or woman; each arm has thirty-two bones, and each leg has thirty. These bones vary very much in size, shape and thickness, and all have been named and described with great minuteness by anatomists.

Composition of Bones.—The bones under every modification of shape and mechanical arrangement are constituted by precisely the same elementary matters, the principles of which are an animal and an earthy substance, in intimate combination.

Phosphate of lime is the most abundant mineral material, being about 51 parts in the 100 of bone. Carbonate of lime, 11.3 parts; fluoride of calcium, 2 parts.

The animal matter of bone is gelatinous, allied to cartilage; originally every bone is developed from cartilage by ossification.

The mineral matter of bone increases with age; making the bones of the old more brittle. There is more of it also in some bones and parts of bones than in others.

Structure of Bone.—A good idea of the structure of a bone may be gained by picking the second joint of a chicken or turkey clean, and then sawing off about an inch of the upper end and splitting this piece in half lengthwise with a hatchet or strong knife. This thigh-bone of a turkey corresponds to the femur or thigh-bone in a human being, where it lies near the centre of the leg and reaches from the hip to the knee. Its upper end may be recognized by its having upon it a single round knob, which formed part of the hip-joint.

Marrow of the Bone.—On examining such a bone it is found to be hollow in the middle, and partly filled with a fatty substance called the marrow of bone. In this marrow run important little blood-vessels, which carry the blood to nourish the bone, and from it they pass and repass to minute channels running lengthwise in its substance, which are called the Haversian canals, after the name of the physician who first discovered them. In dried bones, and especially when they have undergone prolonged bleaching in the open air, such as those of a long dead horse or cow, these Haversian canals may be readily seen, looking like fine pores in the broken ends of the bones.

Telescopic View of the Canals.—Under the microscope they are discovered to be encircled with rings of lacuna, or little holes in the bone substance, each of which communicates with its neighbors by very minute branching tubes. During the life of an animal the lacuna are filled with soft, jelly-like bone-corpuscles, but in dried bones these gelatinous bodies shrivel up, leaving the lacuna empty, except of air, which, by refracting light differently from what the solid bone does, makes the lacuna look like black dots under the microscope.

Bones of a Chicken.—If the breast-bone of a young chicken is examined it will be found that its smaller end is made up of the tough, milk-white or semi-transparent substance called gristle or cartilage. When a chicken is first hatched nearly all its bones are chiefly composed of cartilage, and as it grows older they gradually become more and more ossified, that is, changed into bone. But certain portions of the body commonly

PARTS OF THE HUMAN SKELETON.

Top Central Plate.—This shows the bones of the cranium, or head, eight in number. The large frontal bone forms the forehead. The articulation of the teeth are prominent. It also shows the facial bones, or those of the face, fourteen in number.

Middle Central Plate.—This shows the bones of the chest; the sternum, or breast bone, in the centre; the ten true and two floating ribs on either side, and part of the backbone, to which the ribs are attached.

Lower Central Plate.—This plate shows the bones of the pelvis. Pelvis means basin. It is the basin or girdle by which the bones of the lower body, as the hip bones, are joined to the upper. The two large side bones are the os innominata, or unnamed bones. The central triangular bone is the sacrum, a composite bone, forming the union between the vertebræ and os coccyx, or tail end of the backbone.

Upper Left-Hand Plate.—This represents the eight bones of the carpus (wrist); the five of the metacarpus (between wrist and phalanges), and fourteen bones of the phalanges (battle rank bones), twenty-seven in all.

Next Figure Below.—This is the sacrum, detached from the pelvic girdle. It is also seen in lower middle plate. It is called sacrum (sacred), because it was of old offered up in sacrifices.

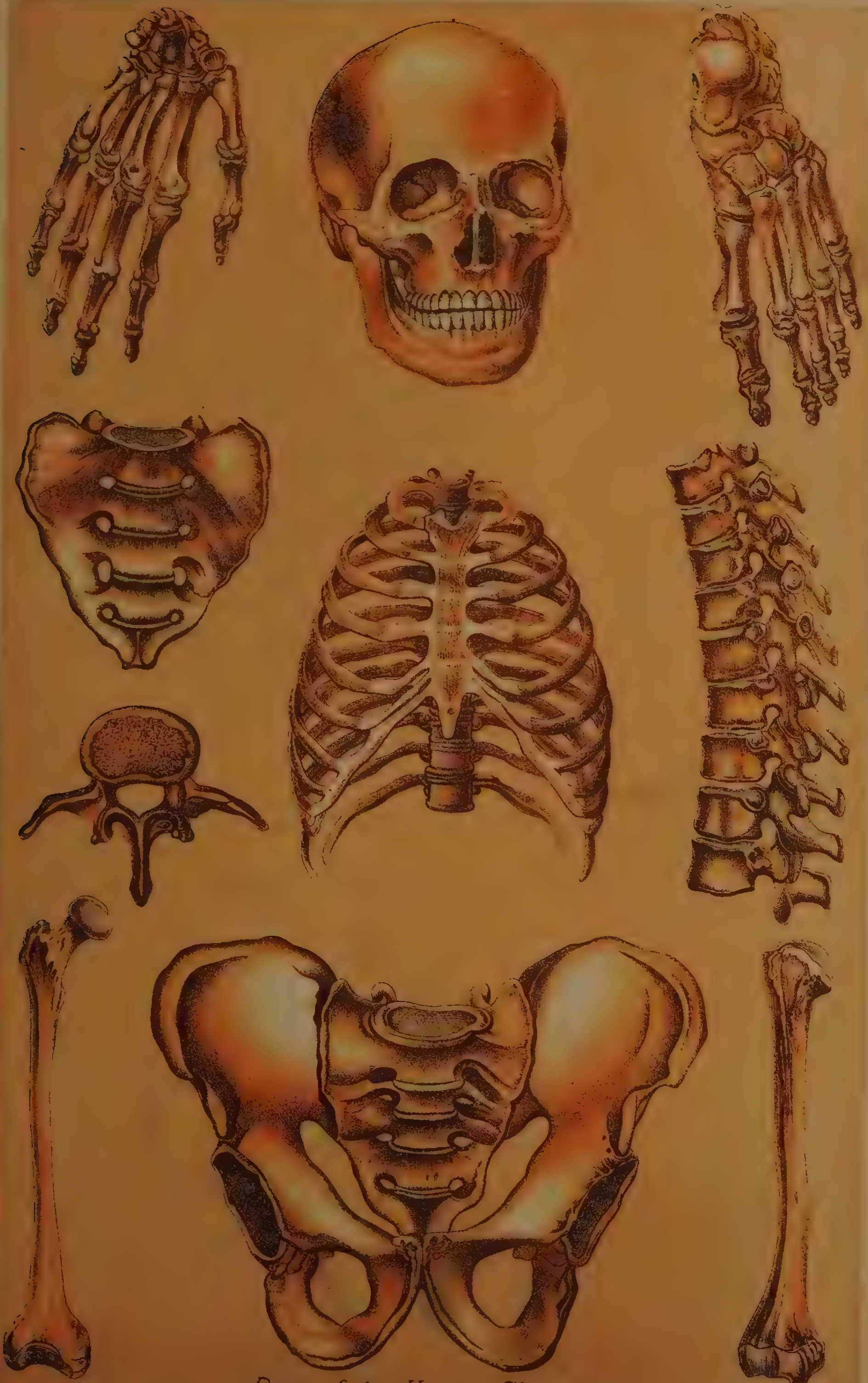
Third Left-Hand Figure.—This is a section, or single joint of the backbone, or spinal cord.

Bottom Left-Hand Plate.—This represents the femur, or great thigh bone. It is cylinder-shaped, and the largest, longest and strongest bone in the body.

Upper Right-Hand Plate.—This represents the bones of the foot. They are divided into three classes. 1. Tarsus, or ankle bones, seven in all. 2. Meta-tarsus (between tarsus and phalanges), five in all. 3. Phalanges (battle-rank bones), fourteen in all, a total of twenty-six foot bones.

Middle Right-Hand Plate.—This represents a part of the backbone or spinal column. It consists of a series of vertebræ, within which is the spinal cord or nerve, to injure which means paralysis or death.

Lower Right-Hand Plate.—This is the humerus (shoulder), or bone of the upper arm. It is the only bone in the upper arm, and it revolves on the scapula (shoulder-blade) above, and the ulna and radius of the forearm below.



Parts of the Human Skeleton.

remain cartilaginous through life, as, for instance, the grisly bands which fasten the ribs to the breast-bone, and the rings of the trachea or windpipe.

Bones of Arm.—The bones of the arm, counting from the shoulder downward as it hangs at the side, are first the humerus or arm-bone, which extends to the elbow, and next the two bones of the fore-arm, which make up the part from the elbow to the wrist, and are named the radius and ulna. The latter of these two bones projects on the under side of the arm, and the radius has the hand attached to it, and is rolled part way around the ulna every time the hand is turned over from the position of pronation, or lying with its palm downward, to that of supination or lying upon its back. This is a very important movement, and great care must be taken by the use of properly padded splints to save it, when the radius and ulna of the fore-arm are fractured by accident, as very frequently happens.

Bones of Wrist.—The wrist or carpus is composed of eight small bones, each with a hard name derived from Greek or Latin, and the palm of the hand is formed by four of the metacarpal, a word meaning beyond the wrist bones, the metacarpal bone of the thumb making the fifth. The bones of the fingers consist of three rows of phalanges, the thumb having two phalanges only.

Beside the bones mentioned, anatomists reckon the shoulder-blade, or scapula, and the collar-bone, or clavicle, as belonging to the arm, or, as they name it, the upper extremity.

Kinds of Joints.—The joints of the arm exemplify the two chief kinds of articulations made use of in the human body, namely the ball and socket joint, of which the shoulder is an example, and the hinge-like joint, of which the elbow is a good illustration. The joints between the metacarpal bones and the first row of the phalanges of the fingers, that is, those at the roots of the fingers, are imperfectly formed ball and socket joints, and allow, as anyone can see in his own hands, of a good deal of lateral or side-wise, as well as backward and forward motion. The other articulations of the fingers are hinge-joints, and like the hinges of a gate, permit only of a back and forth motion.

The Synovial Fluid.—The ends of bones where they rub against each other inside the joints are covered with firm smooth cartilage, and to diminish the friction as much as possible these polished surfaces of cartilage are kept slippery by a peculiar liquid named the synovial fluid or "joint-water." This synovial fluid, called also the synovia, acts the part of oil to a door-hinge, and when sometimes in old people the synovia becomes scanty, their joints will creak and grow stiff, just as the hinges of a door do for want of oil. The ends of the bones in a joint are held in place by a tough, firm wrapper, called the capsular ligament, which encloses them tightly on all sides, and also prevents the synovia from escaping and being lost.

Bones of Leg.—In general arrangement the bones of the legs are very similar to those of the arms, making allowance for the difference in function of the two pairs of limbs. The thigh-bone or femur is the longest and strongest bone in the body, as might be expected from the larger share of work in walking, running and leaping it has to perform. It is articulated (or jointed) to the pelvis at the lower corner of the body by the hip-joint, a ball and socket articulation, which allows of considerable movement in every direction.

Knee to Ankle.—From the knee to the ankle, the leg, like the forearm, is furnished with two bones. One of these, called the tibia, is the shin-bone, forming the front of the leg and the inner side of the ankle, that is, the side next the other limb. The bone on the outer side of each leg and each ankle is named the fibula, and is much smaller than the tibia, its partner in the business of supporting the weight of the body. The ankle or tarsus is composed of seven bones instead of eight, as are found in the carpus, and it is articulated below and in front, near the middle of the foot, with the five metatarsal bones At the front, ends of the metatarsal bones are jointed on the toes, each with its three rows of phalanges, except the great toe, which, like the thumb, has but two.

Nature of Sprains.—The ankle-joint is more apt to be "sprained" or "strained," than any other, and this accident, therefore, requires a few words of explanation here. A strain of a joint is the result of moving the bones which compose it too far, or in an unnatural direction, so that the capsular and other ligaments are stretched or perhaps torn a little by the force applied. A strained joint is very painful, apt to swell rapidly, and often proves troublesome for months, or even years, if not properly treated. Until a doctor comes, the injured articulation should be placed in an elevated position, so that the blood will drain away from it, kept perfectly quiet, and covered with cloths wrung out of hot or cold water, so as to reduce the danger of inflammation.

Bones of Skull.—The bones of the skull or cranium are broad, comparatively thin, and curved in such a way as to make a hollow case or oval box, shaped a good deal like an egg, for the protection of the brain, which is placed inside of them. The most important are the frontal or forehead bone, the two temporal or temple bones and the occipital bone, which is at the back of the head. These bones are united together by seams or sutures, consisting of a curious kind of dove-tailing, which fastens them so firmly together that, in their natural state, it is impossible to get them apart without breaking them.

Character of Skull Formation.—The arched form of the skull makes it much more capable of resisting blows upon the head; but if these are so severe as to fracture the bones, especially if they are dented in so as to press upon the brain, unconsciousness is often very quickly produced. This would happen much more frequently were it not for the layer of spongy matter interposed between the hard plates which form the cranial bones.

Bones of the Face.—The bones of the face are comparatively light and thin, except the lower jawbone, into which are set the lower teeth, and which is the only bone about the head which is furnished with a movable joint, except the occipital bone, where it rests upon the neck.

Bone of Spine.—The spine or backbone is made up of twenty-four verebræ, the sacrum and the coccyx. These latter bones seem to be each composed of several vertebræ, which, for the purpose of being rendered stronger, have grown fast together. The uppermost vertebra is called the atlas, because upon it the head is supported; and the second is named the axis, because upon it the atlas, and with it the whole head, turns, as in shaking the head negatively. The upper seven vertebræ are called the cervical or neck bones; the next twelve are designated as the dorsal or back vertebræ; and the last five are named the lumber vertebræ or vertebræ of the loins. These twenty-four bones are fitted together in such a way as to form a continuous tube, which receives and protects the spinal cord or spinal marrow just as the upper continuation of the spinal cord—that is, the brain—is encased and protected by the bones of the skull. The vertebræ are jointed so as to allow considerable motion, both sideways, forward and backward, and have between each pair a cushion of fibrocartilage, which serves to preserve the brain from injury by the shocks and jars which would otherwise be given to it in jumping, running and various other movements. The sacrum, which is continuous with the vertebræ, is united with two large, flat and irregularly-shaped bones, to form the pelvis or basin at the lower part of the trunk. The pelvis supports the spine and the organs in the abdominal cavity, and is in its turn sustained on each side by the thigh bones, which prop it up at the hip-joints, as already indicated.

Bones of the Thorax or Chest.—The heart and lungs are protected by a bony cage composed of the twenty-four ribs, which lie a little beneath the skin of the thorax or chest and in thin persons can be easily felt at the sides or near the breast-bone. This breast-bone or sternum is situated directly in the middle or front of the thorax and has the front ends of the ribs attached to it by cartilages, named the costal or rib-cartilages, which allow of the outward and upward movement of the ribs, necessary in breathing.

The back or posterior ends of the ribs are jointed on to the vertebræ of the spinal column in such a way as to allow of needful motion, and yet secure sufficient stability and firmness.

Dislocation of Bones.—When a dislocation occurs, or, as it is commonly called, a bone is put out of joint, the bones composing an articulation have been pulled or twisted so hard as to displace them, breaking some of the ligaments which are arranged to keep them in their proper positions.

Example of Dislocation.—Generally, a person whose arm, at the shoulder, for example, is dislocated, suffers a good deal of pain and loses the use of the limb until the bones are put back in their places again, or as it is called, the dislocation is reduced.

A dislocation is one of the heavy penalties people often have to pay for imprudent over-exertion in lifting and wrestling, or for carelessly letting themselves have falls and hard knocks, or becoming entangled in railway accidents.

Repair of Fractures.—The repair of broken or fractured bones is a wonderful process of nature, in which a material called callus, at first like putty, is formed around the broken ends, holding them together, feebly at first, but afterward it gradually hardens, uniting them more firmly indeed.

Since this "knitting" of the broken bones may occur in almost any position they happen to lie in, or are pulled into by the irritated muscles in the neighborhood, it is evidently very important that they should be put and kept in exactly the right place. For this purpose there are many ingenious splints and bandages devised and used by surgeons, as is pointed out in chapter on Wounds and Accidents.

DISEASES OF BONE.

Inflammatory Affections of the Bones and of their enveloping membrane (the periosteum) are occasionally met with, sometimes following injuries and wounds of bone (and microbic infection), but are much more common as a result of syphilitic or scrofulous disease than as a primary complaint.

Symptoms.—Pain is an early and persistent symptom usually worse at night; there is gradual swelling of the affected part, tenderness on pressure, and the skin over the inflamed area becomes red and edematous. If the process goes on in the diseased bone the centre of the portion involved may die or undergo necrosis, as it is termed, just as local death may occur to connective tissue; for example, the slough or core of a common boil.

Nodes.—These are hard bony swellings, the result of a subacute inflammation not going on to caries or necrosis, which are apt to occur as tertiary symptoms of constitutional syphilis.

They are most common in long bones and are frequently found on the front surface of the tibia or shin-bone. They are often very painful for a time,. particularly at night, but yield promptly to treatment with the iodide of potassium in the majority of cases.

Softening of Bone (Osteomalacia).—This is an uncommon disease observed in adults; seldom seen in males, occurring in greater frequency in females. It is characterized by a softening of the bones, rendering them very liable to break or bend on the application of little force; resulting from absorption or deficiency of the earthy matters in the bones. An analogous condition is sometimes found in the insane, and has no doubt given rise unjustly to some of the stories of cruel treatment in asylums for these unfortunates.

Brittleness of Bone (Fragilitis Ossicum).—This is an affection of bone in which the inorganic are out of proportion to the organic constituents, rendering the bones brittle; there is an apparent increase of the earthy matters, with a diminution of the vascularity of the bone. Children and young persons seem to suffer most from this disease, and in many instances an hereditary tendency can be traced. It is probably due to defective innervation.

Osteoma (Chondroma).—The bones are subject to tumors, to cartilaginous or other growths. They form hard rounded tumors, fixed to their point of origin. They may attain a huge size—but are usually small. They grow slowly without pain or other symptoms except such as may be caused by their bulk or pressure, and interfere with the functions of neighboring nerves.

Osteomata are liable to inflammation and necrosis, but never undergoes malignant or cancerous degeneration. Chondromata may not only become inflamed, and necrosis and sloughing follow; but it becomes cancerous in some instances; for instance, after an injury to a bone, a chondroma may appear and develop with terrible rapidity, and upon its removal may return, become cancerous and form secondary tumors elsewhere.

Treatment.—If osteomata or chondromata are removed whilst small the operation is to be recommended, but when left until a huge tumor has developed, of the nature of which no doubt can be entertained, any interference is of questionable propriety.

Synovitis.—Among the important diseases of the joints must be mentioned synovitis or inflammation of the lining membrane, by which the synovia or joint-water is secreted. This disease, usually attended with severe pain, and when the joint is a large one accompanied with much constitutional disturbance and fever, appears in two forms, the acute and the chronic.

Causes.—The acute form is usually the result of injury, which may be very slight in its character, as even the least puncture of the joint by which the air can enter is liable to produce it. Acute synovitis runs its course in ten or twelve days, causing much swelling and severe suffering on the slightest movement of the limb to which the joint is attached. The chronic form is commonly a continuation of the acute, and may itself result in softening and what is called pulpy degeneration of the synovial membrane.

Treatment.—The treatment of synovitis is by free leeching of the affected part; perfect rest in bed, with the limb elevated and secured in a splint if needful; low diet with saline purgatives, such as epsom salts or seidlitz powders, and anodynes to relieve pain. In the chronic form small blisters and painting with tincture of iodine are likely to prove useful. Inflammation of the synovial structure of the joints is apt to take on a rheumatic, scrofulous or syphilitic character in persons who are constitutionally under the influence of these taints. In such instances the appropriate treatment for them, as already pointed out, is to be associated with that for ordinary synovitis.

Ulceration of the cartilages may occur in a joint as a consequence of long-continued inflammation, causing intense pain, and usually disabling the limb. Its liability to occur renders the prompt treatment of synovitis doubly important.

Abscess (Coxalgia).—Abscess within a joint is rare in healthy persons, but in the scrofulous it is by no means uncommon, and in strumous children abscess in the hip-joint, causing the lamentably frequent affection, coxalgia, is a malady of much importance.

Treatment.—The general treatment in these sad cases is that already indicated for scrofula, but the local trouble should be immediately attended to by an experienced surgeon, and remedied as far as possible by the aid of the complicated apparatus devised for the purpose.

Pott's Disease.—This consists of a tubercular inflammation of the bodies of the vertebræ or spinal bones, and their cartilages; and is most common in children between two and ten years of age, although it may occur at any age. In some cases the affection appears to follow a slight injury to the spine in those of tubercular or strumous tendencies, in others the disease develops without apparent exciting causes.

Symptoms.—Rigidity of spine, tenderness and local pain are the prominent early symptoms. Abscess may occur early, but is most common in the late stages. Deformity or spinal curvature usually occurs as a result of the disease process, depending upon the amount of breaking down in the bones and the falling together of the vertebræ, and may be gradual or rapid in its development. Treatment is as indicated in article on Coxalgia.

THE MUSCULAR SYSTEM.

Muscular Function.—The power which moves different parts of the frame, according to the directions of the will, as, for instance, the legs, in walking, is produced by the contraction of muscles. These muscles form the lean meat of animals and of the human body, and, except in very fat people, make up a larger portion of the bulk of the frame than any of its other constituents.

Composition.—They are composed, as is readily seen in a piece of fresh beef or mutton, of long strings of reddish material, which, under the microscope, are found to be made up of a multitude of fine, beaded threads, arranged in small bundles, and called the ultimate muscular fibres. They exercise power in moving the limbs, and so forth, by shortening up or contracting when excited by the nervous fluid, sent to them through the nerves from the brain, as ordered to do so by the will.

Mechanism.—The exact mechanism of moving the arm, for instance, by the process of contraction, may be easily understood from the picture shown on page 621, in which it is readily perceived that the shortening up of the muscle must pull up the hand, bending the arm at the elbow-joint, and changing the position from that represented in the second, to that shown in the third figure. Precisely the same kind of operations accomplish the motions of lifting the feet in walking or climbing, swinging the arm in throwing a ball, opening and shutting the mouth, and, indeed, of most of the voluntary movements of which we are capable.

Voluntary and Involuntary.—But whilst many of the muscles are controlled by the will and are, therefore, called voluntary, many of them are not so ruled, and hence have received the name of involuntary.

Most Important Involuntary Muscles.—Among the most important of the involuntary muscles are the heart, the intercostal muscles, the muscles between the ribs which help to expand the lungs in respiration, and the muscular fibres of the alimentary canal, which aid in pushing along the food in digestion. Fortunate is it for us that such is the fact; for otherwise, when our wills were off duty, as in sound sleep, the operations of these vital organs would stop, and life, which depends upon them, soon cease.

Muscular Attachment.—The muscles are usually attached to the bones, and move them by sinews or tendons, which are made of white, fibrous tissue, the strongest and most flexible material in the body. These tendons are like long, round, white cords, such as may be seen in the lower part of the leg of a chicken. The largest tendon in the human body is that of the heel, called the tendon-Achilles, which is the continuation of the big muscle of the calf of the leg. This powerful muscle is used in jumping and, since it acts at a great disadvantage, is necessarily very strong in order to be able to throw the entire body forward, as in making a leap.

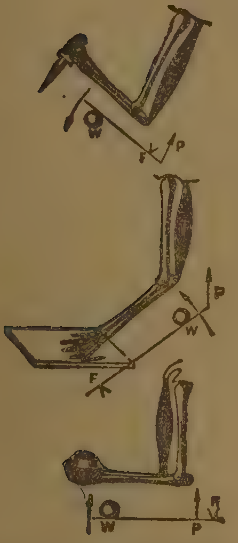
Origin and Insertion.—As a general, but by no means universal, rule, a muscle has one attachment which is fixed, commonly spoken of as its origin, and a second, called its insertion, upon which it acts by drawing it toward the origin when the muscular substance contracts. Muscles mostly pass in a straight line between their two attachments, but sometimes they act around an angle by sliding over a pulley, or by means of a small bone in the tendon, like the knee-pan. The muscles are so attached that they are always slightly on the stretch, and thus, at the moment they begin to contract, they are in an advantageous position to bring their action to bear on the bones which they move. When the contraction ceases, the bones are drawn back to their former position without any sudden jerk.

Muscular Leverage.—The muscles commonly act upon the bones as levers, by working upon the short arm of the lever, so that more direct force is required on the part of the muscle than there is weight in the body moved. From this arrangement, however, the indispensable advantage is gained that the small contraction of the muscle causes an extensive movement of the part acted upon, and much greater rapidity of motion is secured. Each of the three orders of levers is met with in the different bones of the human skeleton; often, indeed, all three varieties are found in the same joint, as, for example, the elbow, where the simple flexion and extension of the biceps and triceps muscles, which are large, fleshy masses on the front and back of the arm, between the shoulder and elbow, afford excellent illustrations, as shown in the accompanying figure.

Illustration of Leverage.—The arm is used as a lever of the first order when the triceps is caused to contract, and by pulling upon the upper end of the small bone of the forearm moves the hand around the elbow-joint, which serves as a fulcrum. This is shown in the upper diagram in which the hand is represented as striking a blow with a dagger.

Again the arm furnishes an example of a lever of the second order, when the hand resting on a point of support, such as a table, acts as the fulcrum, and the triceps muscle pulling on the upper end of the ulna or smaller arm bone, by straightening the arm lifts a weight placed upon it in front of the elbow.

The third order of levers is exemplified by the arm when bent by the contraction of the biceps in ordinary flexion of the elbow. Here the muscle, which is the power, is placed between the fulcrum, which is the lower end of the humerus at the elbow-joint, and the weight, which is lifted in the palm of the hand, as shown in the lower diagram.



Bones of the Forearm Acting as Levers of the Three Orders.

Number of Muscles.—The whole number of muscles in the human being is not far from five hundred, mostly arranged in pairs on opposite sides of the head, body or limbs. It is, therefore, manifestly impossible to describe them all in detail here, and yet there are a few which are important enough to require notice.

Important Muscles of the Face.—Among the muscles of the face should be mentioned those of the eye, six in number, four of which turn the eyeball up or down, inward toward the nose or outward toward the temple, as becomes necessary to see an object distinctly. The muscles of expression are especially attached about the mouth, and produce their effects by puckering up the lips, as in whistling; drawing up the corners and widening the mouth, as in laughing; pulling down its angles, as in weeping, and so forth. The masseter muscles placed inside the cheeks between the upper and lower jaws are very strong, and enable human beings to chew up some very hard articles of food in the operation of mastication, as has been already explained.

Flexor Muscles.—The action of the large muscle of the front of the arm, called the biceps or two-headed muscle, has been already described. The muscles of the fore-arm, which shut the fingers as in clasping the hand, are called the flexors, because they flex or bend the fingers. The tendons by which their power is conveyed may be readily felt on the inside of the wrist of a man who tries to shut his hand when the fingers are forcibly held open by another person. The fore-arm muscles which open out the fingers after the hand is closed, in doubling up the fist for instance by the flexors, are called the extensors. The tendons of the extensor muscles, when the latter are strongly contracted, show very distinctly on the back of the hand, as straight, hard cords, running from the root of each finger to the middle of the wrist.

Muscles of the Spinal Column.—The spinal column is almost surrounded, except in front, by a thick mass of muscles, which gives the great strength required by many kinds of laborers, such as porters who carry heavy loads upon their backs. The muscles of the leg, which are needed in walking, running and jumping, are very large and strong, corresponding to the hard work they are called upon to perform.

The Longest Muscle.—The longest muscle in the body is the sartorious or tailor's muscle, which is so named because it helps to bend the lower limbs into the cross-legged posture so frequently adopted by tailors. It lies on the inside of the thigh, is thin and narrow, but sometimes measures over two feet in length.

Intercostal Muscles.—The intercostals are flat, thin layers of muscular fibres, which extend from the lower edge of each rib, except the last pair, to the upper margin of the rib next below. In this way they fill up all the spaces between the bars of the bony cage in which the lungs are contained, and, when they contract, pull up these bars or ribs so as to widen and deepen the cavity of the thorax, and so cause air to be drawn into the lungs.

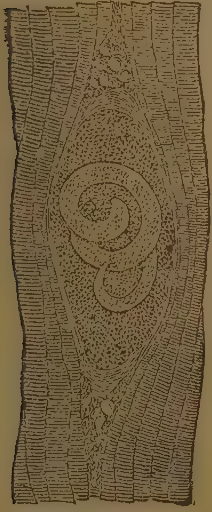
DISEASES OF THE MUSCLES.

Inflammatory Disease.—Inflammatory disease of the muscular system except as it is connected with rheumatism or pyemia, is extremely uncommon. When it occurs it is liable to go on to suppuration, and the formation of abscess. The pain is dull and aching rather than acute, and the disease is to be treated as already directed in speaking of the management of boils.

Hypertrophy and Atrophy.—These occur in muscles and produce effects important or otherwise, according to the position of the muscle in the animal economy. The most important hypertrophy is that of the muscle composing the heart, the influence of which has been detailed in the article on valvular disease affecting this organ.

Contractions.—Palsy and spasm in various forms have also been considered in the chapter on diseases of the nervous system, upon which these disturbances chiefly, though not entirely, depend.

Trichiniasis.—The most important disease of the muscular system not yet discussed is its infection with parasites, and particularly with the trichina spiralis or pork worm, which, in consequence of the late embargoes upon American hams and bacon, has assumed a national or, indeed, an international importance. The great fatality in many cases of trichiniasis, as the malady produced by the trichina has been named, and the ease with which the whole trouble can be avoided by a proper understanding of the nature and origin of the affection, render a full account of the entire malady and its means of prevention singularly appropriate to a popular work like the present one.

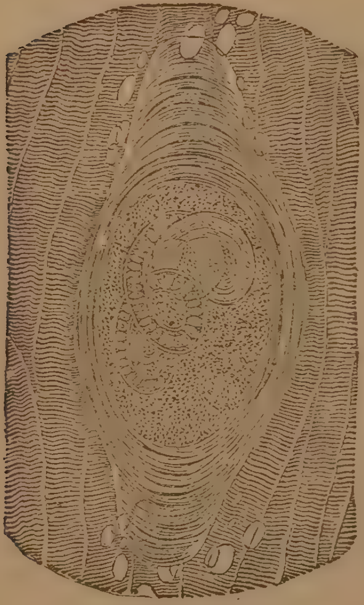

Trichina Spiralis in Human Muscles.

The Trichina Spiralis.—The trichina spiralis, which is next, perhaps, to the echinococcus, the most dangerous animal parasite infecting man, is found also in pigs, foxes, guinea-pigs, rats, cats, mice, marmots, polecats, badgers, and more rarely in some other animals, including the dog. A physician of Philadelphia found that of ten cats which he dissected in 1879 nine were infested with trichinæ.

Sources of Trichinæ.—Pigs, from which the human race is most apt to become diseased with trichina, are supposed to become themselves infected, chiefly from eating rats, the offal of other pigs, and the excreta of human beings containing trichinæ. It is doubtful whether a single case of trichiniasis in man ever occurred where the patients became infected otherwise than by eating raw or underdone pork, and the most common sources of infection are, sausages, ham and bacon.

How Trichinæ Breed.—If the trichinæ existing in diseased pork are very young they may be simply digested, when they reach the human stomach, without being developed. But if the parasites have attained their fuller growth, the cysts which contain them are alone dissolved by the gastric juice, and the embryo is set free. These embryos, after they pass through the pylorus and duodenum, soon become mature, and their thread-like appearance renders them quite easily recognizable by the naked eye. Countless eggs are now discharged by the females, and in about a week's time the new brood of trichinæ hatched out from these eggs begin to make their way to the muscles, either by boring their way through the soft tissues, or by being carried along by the current of blood in the blood-vessels, or perhaps by both of these methods of progression through the body. These larval trichinæ attain their full size in about two weeks from the time they leave the egg. The males and females are each about one-thirtieth of an inch long and about one seven-hundredths of an inch broad.

Effects of Trichinæ.—In some few favorable cases severe gastro-intestinal inflammation is set up, and the parasites are violently expelled by diarrhœa, without being able to enter the muscles at all, so that if it were possible to detect the malady with certainty at this stage, nature thus suggests the appropriate treatment by drastic purgatives. In the majority of instances, however, the migration of immense numbers of larval trichinæ from the intestinal canal takes place, and occupies in general about four days only. In this brief space of time even the most distant muscles of the body may all be invaded.

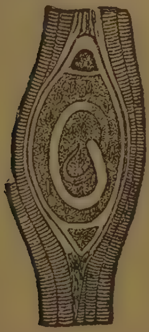


Encysted Trichina More Highly Magnified Showing Structure of the Parasites.

Symptoms.—Among the earlier symptoms of the trichina disease are a general feeling of debility and discomfort, and a loss of appetite, to which succeed nausea and vomiting, diarrhœa, prostration of strength, and a sensation of stiffness about the neck, arms and legs. These evidences of illness resemble, it will be observed, to a great extent, the first stage of typhoid fever, for which the cases are usually mistaken if there is no point in the history of the patient to suggest trichiniasis. The further progress of the parasites through the tissues sets up high fever, with frequent pulse and copious offensive perspirations, although the temperature of the body seldom or never reaches the elevation which characterizes that of typhoid. For some days the stiffness of the limbs seems to increase, while all the muscles become painful, swollen, and very sensitive to the touch.

A Characteristic Sign.—About the end of the first week the attention of the attending physician is usually awakened (if it has not previously been aroused) to a suspicion of the trichina disease by the appearance of an edematous swelling of the eyelids and root of the nose. This is often the first characteristic sign of trichiniasis, and should be looked for at this period of the illness in all cases of supposed typhoid and rheumatic fever. During the second week movement of the intercostal muscles in respiration grows very painful, thus preventing to a great extent the necessary repose of the patient. If the diaphragm is invaded, severe hiccough is apt to come on, and when the larval trichinæ commence to infest the laryngeal muscles hoarseness and loss of voice make their appearance.

Cause Paralysis and Exhaustion.—When a large quantity of trichinous meat has been eaten, so that the immigration into the muscles of the afflicted patient is by millions, they soon cause an almost paralyzed condition, attended by excessive exhaustion. The facial edema continues through the second week, when it generally disappears, and is followed by swelling of the feet and legs, and ultimately of the trunk. At the end of the third week, if the patient survives to this period, the pulse and respiration are very frequent, the tongue is red and dry; the mouth can scarcely be opened, the sweating is profuse, the pain so severe that little or no sleep can be obtained, and there is great anxiety or delirium, death frequently occurring in the fourth or fifth week, with symptoms of profound exhaustion.

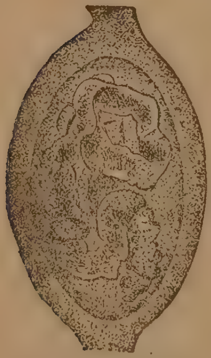


Commencing Calcification of Trichina Cyst.

Complications.—Complications, such as pneumonia, peritonitis and pleurisy, are not uncommon, but in favorable cases when the number of trichinæ is comparatively small, or the constitution of the patient unusually vigorous, the pain, swelling and diarrhœa begin to abate, the oppression of breathing passes off, the desire for food returns, sleep is obtained, and the anemic patient enters upon a slow and tedious convalescence; the parasites having become encysted within the muscles, these gradually become acclimated, as it were, to the presence of the foreign bodies, and slowly regain most or all of their original powers and functions.

Further Symptoms.—After piercing the fibrous sheath of the muscular fibre bundles, the embryonic trichinæ become encysted within lemon shaped capsules (generally one worm in each capsule), of a sort of connective tissue, in which they have some freedom of movement. After a time, these capsules, which, of course, are fixed to one spot in the muscle, become calcified, a process which occupies in man about two years. During this period there is often, for a time, in patients who recover, some loss of power, for a while almost complete, in muscles or groups of muscles; but not infrequently, after this stage is reached, entire recovery ultimately seems to take place. Still, this infested condition of the muscle, which probably exists in thousands of people who walk about utterly unconscious of it, may be the yet undetermined cause of rheumatism and paralysis, or promote the development of consumption and other wasting diseases.

Size of Mature Trichinæ Spiralis.—The mature trichinæ—the males being about one-eighteenth and the females about one-eighth of an inch long—live in the intestines for six or eight weeks. They never reach the soft tissues of the body, in which their young larvæ are so abundant, but are discharged, from time to time, with the excreta of the patient, either alive or after their death has occurred.


Trichina and its Cyst Completely Calcified.

Discovery of Trichinæ.—Trichinæ, as well as cysticerci, were first discovered in human beings in the dissecting room, by Dr. Simon, in 1835. Professor Owen first described and named the trichinæ, and Professor Leidy was the first to detect them in the pig. They were, however, repeatedly observed without their true import being ascertained until 1860, when Dr. Zenker, of Dresden, explained their origin and relation to certain symptoms of obscure attacks of sickness, and described the disease trichinosis or trichiniasis. In the same year Leukart published his elaborate and trustworthy investigations upon the subject of the trichina. Previous to 1860 the trichina had been identified only once in pork, although, as occurring in man, it had been well known for a quarter of a century. It is not decided how it will retain its vitality when encysted in human muscles.

Remarkable Vitality of the Trichinæ.—Professor Langenbeck, of Berlin, has reported a case where, in removing a tumor from the neck of a patient, eighteen years after the man had an attack of trichiniasis, which passed for poisoning at the time, he found living trichinæ in the fragments of attached muscles; and it is stated on good authority that they have been known to exhibit signs of life after a still greater lapse of time. As in this instance, before Zenker's discovery, very many cases passed for poisoning, for typhoid and rheumatic fever, and for other diseases. An epidemic involving over five hundred persons in Blankenberg, Germany, was treated as an outbreak of gastro-rheumatic fever, and it was only several years afterward that the attention of one of the gentlemen who suffered from the disease being called to Zenker's discovery, he submitted to an operation for the removal of a small piece of one of his pectoral muscles, in which encysted trichinæ were detected, and the true nature of the disorder which had affected the five hundred patients many years previously was revealed for the first time.

Epidemics of Trichiniasis.—In this country severe epidemics have occurred in New York, Mississippi and Iowa, and isolated cases are from time to time appearing in various other States. In 1875, it is stated, that there were some eighty cases of trichiniasis in Berlin, and about seventy-five near Hanover. A group of cases occurred in 1882 in Bridesburg, and another near New York. In 1874 there was quite a severe epidemic in the family of a pork packer residing in Buffalo, New York. The disease is as rare in France as it is common throughout the German Empire.

Vitality of Trichinæ After Death of Infected Hog.—In pork the trichinæ may be found either encysted or naked among the muscular fibres. It is not certain how long they may live after the pig is killed, but they are known to be capable of propagation after remaining for one hundred days in putrid pork. The frequency of the disease in swine is probably as great, if not greater, in America than elsewhere; but here mankind is not so often infected, because less raw or under-done sausage, ham, bacon, and so forth, is eaten with us than in Europe. Of 1,394 hogs taken at random, and examined by the Chicago Academy of Sciences, twenty-eight were found to be infected with trichinæ; but this large proportion can only be accounted for on the supposition that an epidemic among swine was then raging.

Method of Detecting Trichinæ.—The editor of the *American Journal of Microscopy* recommends that in examining the flesh of swine suspected of being infected with trichinæ, the following method should be adopted: The parts of the animal to be first tested are the diaphragm, the tenderloin, and the muscles of the head and throat. In the ham, the most likely place to find the parasites is where the muscle ends in tendon. A thin slice should be cut off with a sharp scalpel, or with a pair of scissors curved on the flat. This thin section should then be soaked for some minutes in

THE MUSCULAR SYSTEM (See Adjoining Plate).

The plate presents a comprehensive view of the front muscles of the body. They may be grouped and viewed thus:

Head Muscles.—1. These are seen above the eyes, and are used for elevating the upper eyelids and corrugating the forehead.

Face Muscles.—2. These are muscles of expression and mastication. Those about the eyes are used in winking and opening and shutting. Those seen at either side of the nose lift the cheeks and lips. Those at the sides control the lower jaw in eating.

Neck Muscles.—3. These serve to lower and raise the head and turn it from side to side.

Shoulder Muscles.—4. These embrace the shoulders and upper arm. They are the great lifting and hitting muscles. The prominent one on the upper arm is the biceps muscle, or muscle with two heads.

Muscles of Forearm.—5. These control rotary, flexor and extensor motion, from the elbow to the wrist.

Hand Muscles.—6. These control all hand motions—opening and shutting, rotation, flexor and extensor movements.

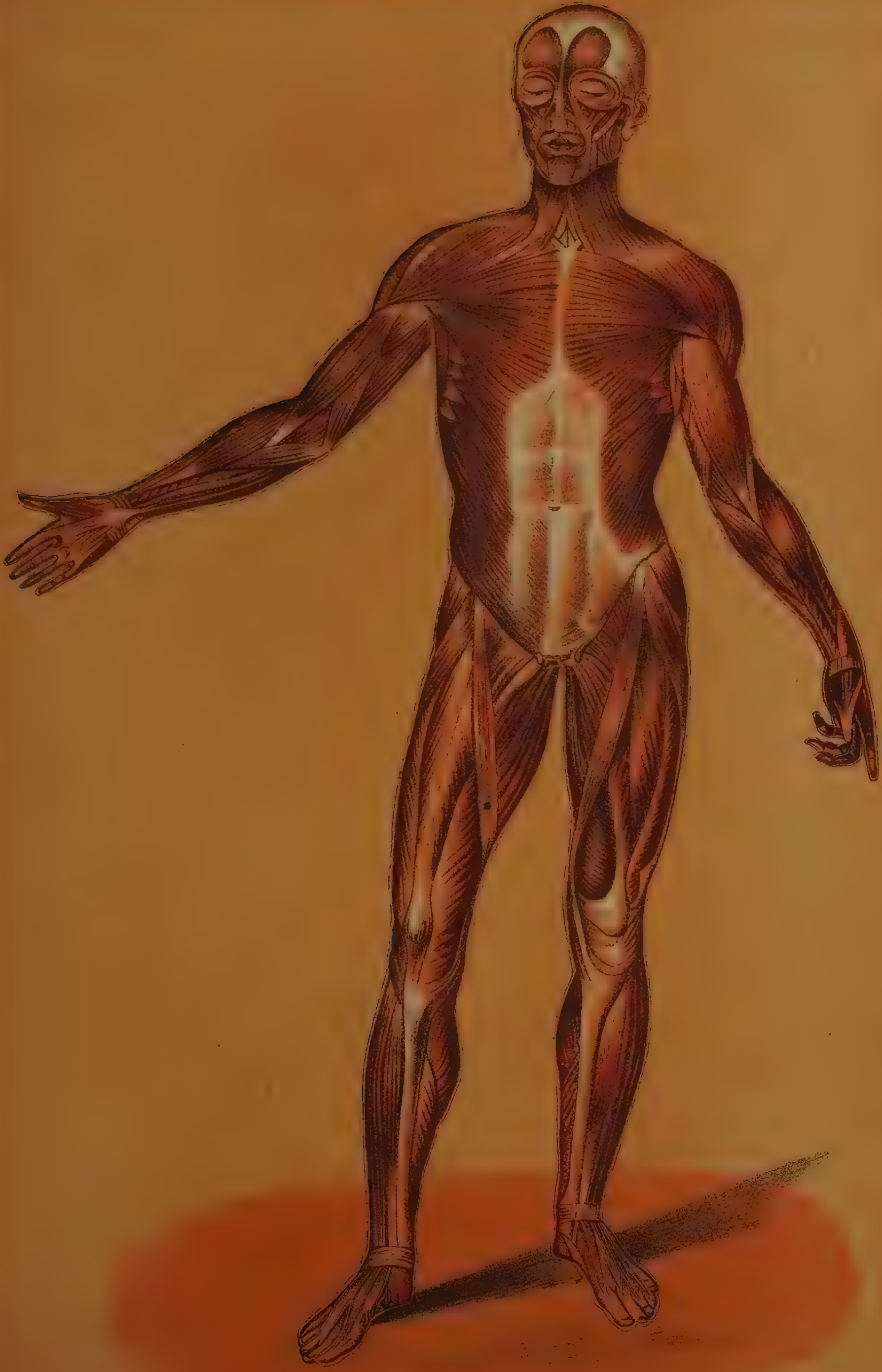
Chest Muscles.—7. These are radiating from sides to centre. They control the twisting, elevation and lowering of the upper part of the body.

Abdominal Muscle.—8. This is seen in the centre, in white. It is intimately connected with breathing and raising and lowering the diaphragm. At its top is the *solar plexus*, the spot upon which prize-fighters seek to deliver their knock-out blows.

Hip, Thigh and Leg Muscles.—9. These powerful muscles coöperate for every kind of movement and exhibition of strength. The two strap-like muscles of the upper leg are the sartorial, or tailor's, muscles, which enable us to cross our legs.

Lower Leg Muscles.—10. These are also powerful, and possessed of rotary, flexor and extensor power. They largely control the feet in walking, operating clear to the ankle joint.

Foot Muscle.—11. These control from instep to toes, each toe having its elevating and depressing muscle. The rotary motion of the foot is imparted wholly from the ankle.



The Muscular System – Front view

acetic acid, spread out on a glass slide, and covered with a thin glass in the ordinary way; or, if the section happens to be very thick, a compressorium, in which the two plates of glass are forced together by means of a lever and screw, will be found very useful.

A little instrument constructed on the plan of the compressorium, and called a "trichinoscope," is sold to supply the popular demand for home protection against trichinæ.

Infected Pork Should be Destroyed.—All pork which has been found to contain trichinæ should be seized, condemned and destroyed, either by fire or by strong mineral acids, such as the sulphuric or nitric. Mere burying of poisonous meat of this kind is obviously not sufficient. Moreover, the question as to whether owners of such carcasses should not be compensated for all property confiscated, is well worthy of consideration; because if such was the rule, butchers and dealers would have no inducement for concealment and fraudulent sale.

Human Muscle Containing Calcified Trichinæ. (Natural Size.)

Only Safe Rule.—In spite, however, of any apparently perfect system of inspection, such as that adopted in Germany, dangerous meat, from some cause or other, will necessarily escape observation, so that the only safe rule for us to adopt, and to urge upon everybody else, is never to eat any pork which has not been thoroughly cooked.

It is not safe to trust to pickling and smoking, even when these processes are combined, as is ordinarily the case, and it must be borne in mind that meat is seldom thoroughly cooked when cut in slices more than an inch thick.

The fact that two dangerous and often fatal maladies like trichiniasis and cysticercus disease, both of which are generally beyond the reach of medical treatment when once they have infected the human system, are not infrequent from eating pork which has been imperfectly cooked, should render the employment of this culinary precaution in regard to all meats universal, especially as it is a safeguard so easily applied.

Myositis.—This affection consists in an inflammation of the voluntary muscles, and many arise from injury to or overuse of a muscle, from gout or rheumatism, from secondary syphilis, or from infection followed by suppuration.

Treatment.—The treatment for injury or overuse of muscle is absolute rest of muscle and the local application of anodyne lotions.

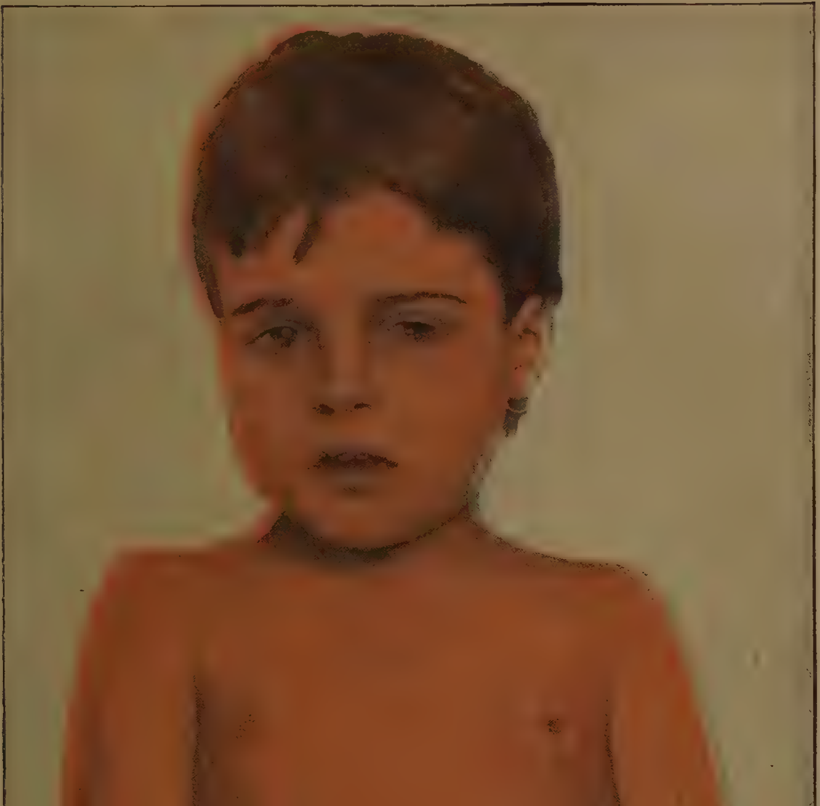
If due to rheumatism or syphilis, prompt relief will follow treatment appropriate to these affections.

Degeneration of Muscles.—Fatty degeneration is occasionally observed in muscular tissue—in which the tissue is converted into a fatty granular mass.

Treatment.—By use of passive motion, massage and electricity to improve nutrition of the muscles.

Ossification.—Ossification of a portion of a muscle, or more frequently of its point of insertion into a bone, is occasionally observed as a result of long-continued irritation. Its course is slow and unaffected by treatment.

Tumors.—Muscles may be the seat of cancerous, syphilitic, vascular, cartilaginous or osseus growths. The treatment depends entirely upon their nature; non-malignant growths can often be removed by dissection; cancerous or malignant growths involving muscles of the extremities should be cut out or, as many cases call for, prompt amputation of the limb.



MEASLES (RUBEOLA).
5th and 6th days.

CURATIVE MEDICINES

PART XII.

DISEASES OF CHILDREN.

Proneness of Children to Certain Diseases.—While the diseases incident to those between three and fifteen years of age, which constitutes the period of childhood, are not confined exclusively to this time of life,.and while there are few, if any, which may not occur also among infants or adults, children are particularly prone to the development of certain ailments which are rarely seen among those either older or younger. Many of the acute infectious diseases, such as scarlet fever, measles and chicken-pox belong more especially to this period, first, because children seem particularly susceptible to them; and, second, because, as they reach an age when they begin to mingle with others, they become liable to exposure to contagion, and having once had them they become, as a rule, immune, or free from liability to their recurrence, from the well-known fact that most of these diseases generally occur only once in a lifetime.

As these constitute a large proportion of what are ordinarily known as children's diseases it will be appropriate to consider them first.

ACUTE INFECTIOUS DISEASES.

MEASLES.

General Description.—This disease, known also as morbilli and rubeola, is highly contagious, being conveyed not only by the touch and breath of the one affected, but also by infected articles and by a third person. Of all the contagious diseases it is the most liable to recur, there being sometimes, though not often, several attacks in the same person.

Characteristics.—It is characterized by fever, catarrhal symptoms and an eruption. Unless complicated by more serious ailments, such as bronchitis, which is the most frequent, it is rarely fatal if malignant forms such as hemorrhagic and black measles be excepted. From ten to twenty days elapse after exposure to contagion before the symptoms develop.

Symptoms.—The ordinary symptoms of a cold in the head, with feverishness and often headache and nausea are usually first noticed, being accompanied or soon followed by cough. These persist with increasing fever until, usually on the fourth day, an eruption appears, beginning on the forehead, neck and face, and during the next twenty-four hours gradually extending over the entire surface of the body. It consists first of distinct, slightly raised red spots resembling flea-bites, which disappear momentarily on pressure; they gradually increase in size and sometimes join each other, becoming confluent and making continuous patches of dusky redness, between which healthy skin may be seen.

An entire day before the eruption appears, examination of the inner surface of the cheeks will reveal the presence of bluish-white spots.

Length of Eruption.—The eruption remains at its height only about a day, when it begins to fade, and in two or three days it has entirely disappeared. To a less extent than in scarlet fever, desquamation of a fine branny character follows, more especially when the eruption has been intense.

Temperature.—The temperature, which during the first few days continues to rise, gradually declines when the eruption appears.

Swollen Glands.—At the height of the disease the glands of the neck and the features are swollen, and the eyes are sensitive to light and affected with a profuse watery discharge which may become thicker.

Diagnosis.—Measles may be mistaken for scarlet fever and for German measles. Its rash, however, is more blotchy and less uniform than that of the other diseases and does not appear as early as does that of scarlet fever. The catarrhal symptoms are more pronounced, while in scarlet fever sore throat is a prominent feature.

Treatment.—**1.** For the fever, from five to ten drops of sweet spirits of nitre in a teaspoonful of solution of acetate of ammonium, or simply in sweetened water, every two or three hours, will not only reduce the temperature but act on the skin and kidneys.

2. If a laxative is needed give a half wineglassful of citrate of magnesia every half hour until the desired effect is produced. Or give one-twelfth of a grain of calomel every hour. This will be helpful also in settling the stomach if it is irritable, especially if combined with two grains of bicarbonate of soda.

3. For diarrhœa, which sometimes occurs, give a teaspoonful of chalk mixture every two or three hours, with five or ten drops of paregoric and two or three grains of subnitrate of bismuth.

4. For the inflamed eyes, bathe them with tepid water and drop into them every hour or two a few drops of a solution of twenty grains each of borax and boric acid and an ounce each of rose water and camphor water. The surface of the eyeball may be thoroughly cleansed with this solution, by gently separating the lids with the thumb and forefinger of the left hand and carefully expressing a medicine dropper full of the liquid into the corner of the eye. Before using it the liquid should invariably be made lukewarm by immersing the bottle containing it in a vessel of warm water for a few minutes.

5. The cough will be relieved by freely drinking flaxseed tea, with a little sugar and lemon juice, or by a half teaspoonful of brown mixture given every two hours. Camphorated oil may be applied to the chest every few hours, and a thin sheet of cotton wrapped around the chest to protect from liability to cold. If persistent, the cough may be benefited by the following, given in doses of a teaspoonful every two or three hours to a child from five to ten years old:

LATIN.		ENGLISH.	
℞.—Ammonii carbonat...	16 grains	Carbonate of ammonium......	16 grains
Ammonii chloridi....	24 "	Chloride of ammonium........	24 "
Syr. pruni virginiam, q. s. ad...........	3 fluidounces	Syrup of wild cherry enough to make..................	3 ounces

6. During convalescence it is advisable to give some such reconstructive and tonic as syrup or solution of hypophosphites, a teaspoonful three times daily, or a like amount of a good extract of malt, with or without cod-liver oil. This will aid in the prevention of serious constitutional and pulmonary ailments which sometimes occur as sequels of this disease.

Nursing.—The patient should be kept in bed and protected from exposure to cold, as the chief danger is from liability to bronchitis and pneumonia. Bathing the body with lukewarm water every few hours, uncovering only a small portion of the surface at a time, will add to comfort and aid in reducing fever. The room should be kept darkened on account of the condition of the eyes. When the eruption appears to be delayed or does not come out well, warm baths and hot drinks should be employed.

Diet.—Plain, simple, nutritious diet, such as is suited to all fever cases, should be given. Milk and broths will be found useful as a foundation for other articles of food.

GERMAN MEASLES.

General Description.—German or French measles, known also as rötheln and rubella, is a contagious disease, usually mild in character, having as its main features fever and eruption. It resembles in some respects genuine measles. After exposure to contagion, from ten to twelve days elapse before the symptoms develop.

Symptoms.—Frequently the first symptom, and always early in the course of the disease, is the appearance of an eruption on the face, which during the first day spreads to the body and extremities. It consists of reddish spots, rather brighter than those of measles, which like those in that disease are somewhat raised and disappear on pressure. In the course of two or three days it fades away and is followed by slight branny desquamation. Accompanying this are slight fever and mild catarrhal symptoms, with quite frequently swelling of the glands of the neck.

Diagnosis.—The diagnostic points to be observed are sufficiently noted in the section on measles to which the reader is referred.

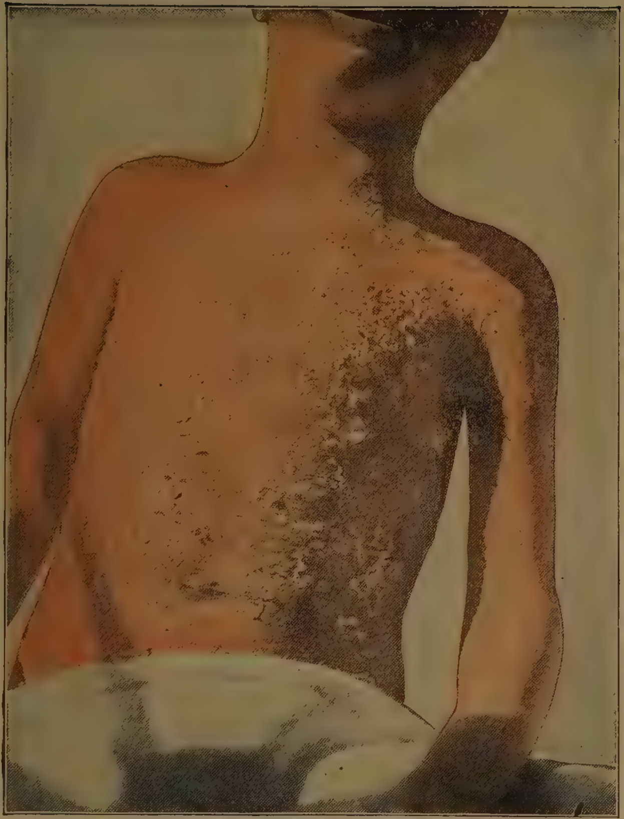
Treatment.—Rarely is more treatment needed than the spirits of nitre, recommended for the fever of measles, and for the itching of the skin, which is sometimes an annoying symptom, the surface may be dusted with compound stearate of zinc with menthol.

Nursing and Diet of a special character is not needed.

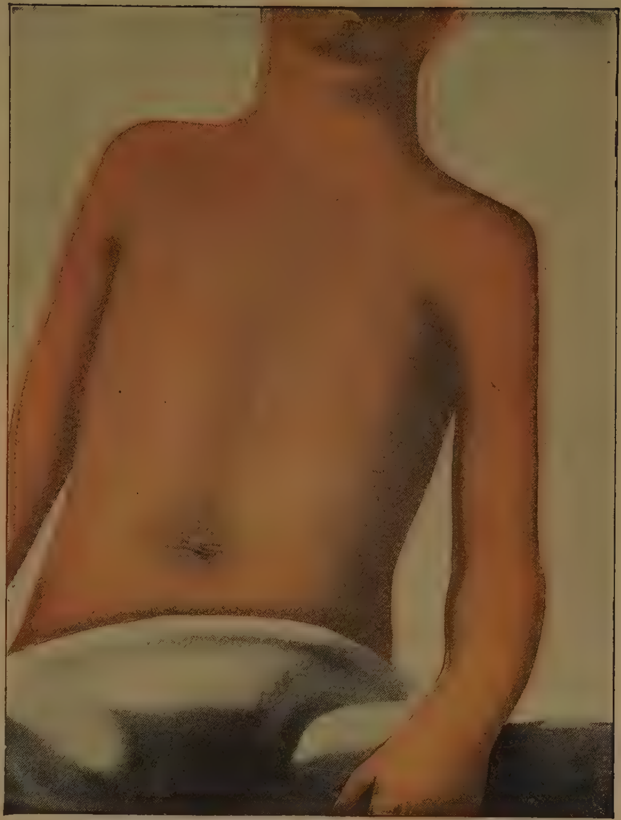
SCARLET FEVER.

General Description.—Scarlet fever is one of the most serious of the acute infectious diseases of childhood, and s characterized by fever, eruption and sore throat. It is known also as scarlatina, a term often erroneously understood to mean a mild form of the disease. Though distinctly contagious it is not so markedly so as measles, but infected articles of clothing, and so forth, retain the power to convey the disease for long periods of time. One attack generally protects from another, although exceptions to this rule occur. From three to twelve days, and sometimes more, elapse after exposure to contagion before the disease develops.

Symptoms.—These are usually sudden in their onset. The child previously apparently well or merely languid is without assignable cause seized with vomiting or has a chill. High fever, with the temperature ranging from 103 degrees to 105 degrees, rapidly supervenes, the face is



SCARLET FEVER.
Period of Decline.



SCARLET FEVER (SCARLETINA).
3d and 4th days.

flushed, the throat is inflamed and dry, the head aches and the tongue is somewhat coated, with red points projecting above the surrounding surface, somewhat resembling a strawberry in appearance.

Usually on the following day a scarlet eruption appears, first on the chest, and extending rapidly over the body, being most marked in the flexures of the joints and where the surface of the skin is particularly subjected to pressure or heat. This redness may be quite uniform or may occur in patches, with intervening areas of healthy skin. On drawing the fingers quickly over the surface a white line appears, which is, however, replaced almost at once by the original efflorescence. On this red base are to be seen many distinct, bright, minute red points, and occasionally larger red spots. The inflamed surface occasions itching of varying intensity and swelling of the skin. In the course of two or three days the eruption gradually fades, and with this the temperature declines. The outer layer of the skin now gradually peals off in flakes of variable size, the palms of the hands and the soles of the feet usually being the last to undergo this process. Until this has entirely ceased, and it may be prolonged to six or eight weeks, the danger of conveying the disease persists, inasmuch as the source of contagion lies largely, though not exclusively, in these particles of skin.

Prominent Features of the Disease.—Among the most pronounced features of the disease are the swollen glands of the neck and the inflamed condition of the throat, which may be so marked as to produce patches resembling those seen in diphtheria. These consist of a membranous exudate which sometimes extends from the throat into the adjacent passages, causing serious complications. Among these is inflammation of the middle ear, with perforation of the ear drum, one of the most frequent causes of deafness. Frequently the kidneys become involved, acute inflammation of greater or less intensity occurring. Recovery from this, however, is usual.

Convulsions.—Convulsions may be present either from the kidney complications or from profound impression on the nervous system by the poison of the disease In the latter cases the disease assumes a malignant type, with excessive temperature, delirium, stupor and often diarrhœa and vomiting, as symptoms which rapidly lead to a fatal issue, sometimes within a few hours. On the other hand cases occur which are so mild as to be scarcely recognizable as genuine scarlet fever, except from observation of a sequel and inquiry as to preceding circumstances. A physician, for instance, may be consulted for edema or dropsy of the extremities, indicating the existence of kidney affection, and on investigation may ascertain that a few weeks before the child had had a slight rash, followed by desquamation, without complaining sufficiently to be kept in bed, and that there is a history of its having been exposed to the contagion. Such a record would justify the diagnosis of scarlet fever.

Irregular Manifestations.—Besides these variations from the usual type of the disease there are irregular manifestations, such as the hemorrhagic form, and grave complications such as gangrene and heart disease, which cannot, however, within the limits of this article, receive more than passing mention.

Diagnosis.—1. Acute exfoliative dermatitis is a disease of the skin in which marked desquamation occurs, resembling in this particular scarlet fever. The throat symptoms, however, so significant of the latter disease, rarely occur, nor is the characteristic appearance of the tongue present.

2. **Measles.**—The throat symptoms instead of the catarrhal manifestations; the sudden onset instead of the gradual development; the character of the eruption and the fact that it appears much earlier in scarlet fever, and the difference in the temperature record usually suffice to enable a diagnosis without much difficulty.

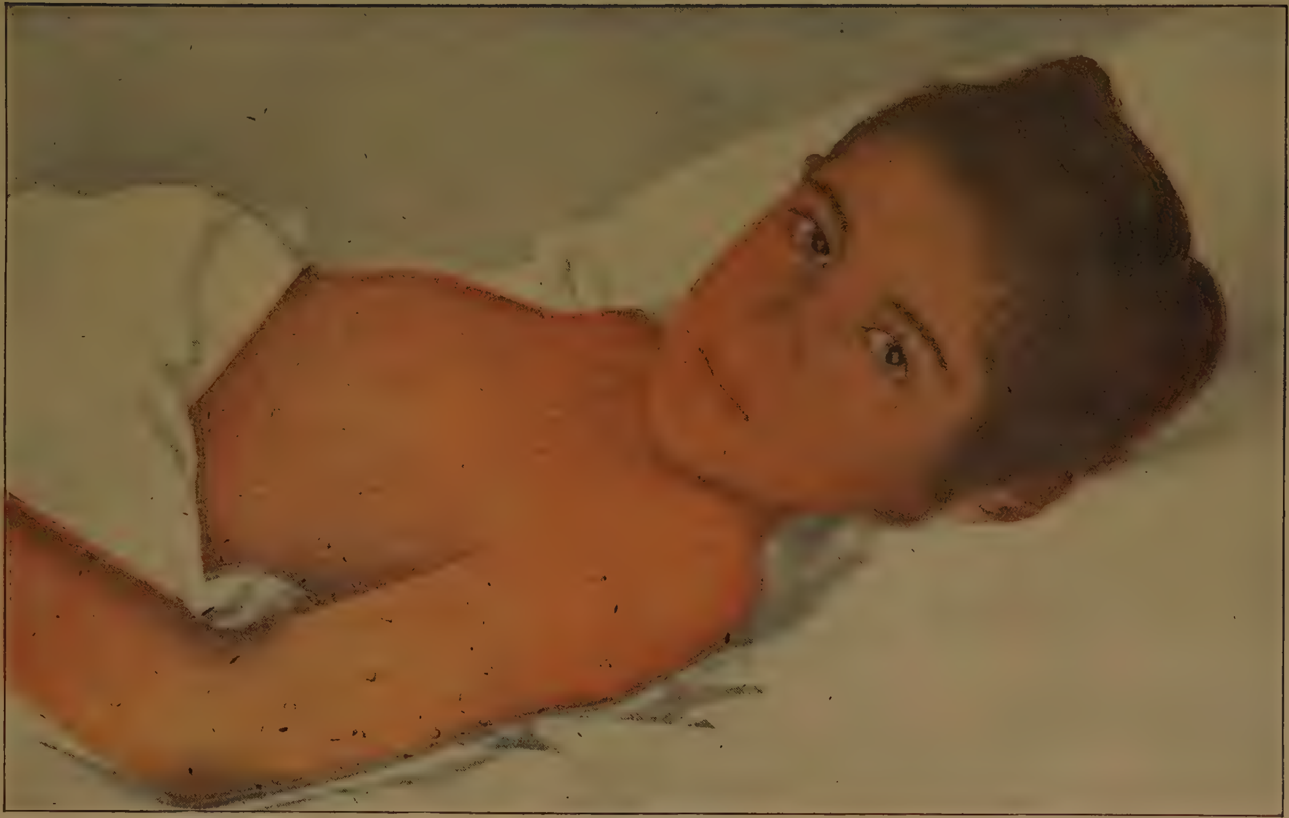
3. **German Measles.**—This has already been discussed in connection with that disease.

4. **Diphtheria.**—From this disease it differs, in that the false membrane in the throat does not appear for a number of days after the beginning of the illness, whereas in diphtheria it is seen at once. The early appearance and the characteristics of the eruption are also diagnostic points of value.

Nursing.—A warm bath at the outset of the disease will promote the activity of the skin and aid in bringing out the eruption. Frequent sponging with lukewarm water throughout the attack is of advantage. When desquamation begins the surface of the body should daily be anointed with carbolized vaseline or other ointment oil to facilitate the process of scaling and to aid in preventing the small particles from becoming scattered. Particular care should be exercised to gather all these and burn them. In order that all may be obtained a large sheet should be spread on the floor beneath the bed. The utmost caution should be observed to prevent the patient from taking cold, both during the attack and after convalescence is established, and for fully a week after the temperature is normal he should still be kept in bed.

Diet.—Milk, broths and water may be freely given, and if the fever is high ice bags may be advantageously applied to the head.

Treatment.—1. For the throat symptoms, a spray of peroxide of hydrogen and water, equal parts, should be used; or a saturated solution of



CHICKEN POX.
2d or 3d day.

chlorate of potash may be employed as a gargle. Cold applications to the neck are also useful.

2. In severe cases stimulants may be required for the weak condition of the heart. Half teaspoonful doses of whiskey, or ten-drop doses of aromatic spirits of ammonia in water should in these cases be given every two hours. Drop doses of tincture of digitalis every three hours are also useful.

3. In case the inflammation extends from the throat and involves, as it often does, the ear, the aid of a specialist in ear troubles will probably be required to save the patient from impairment of hearing.

4. In inflammation of the kidneys, five grains of acetate of potash and a teaspoonful of infusion of digitalis every three hours will be proper for a child five years of age.

5. The following is useful for the reduction of fever:

Tincture of aconite..................	20 minims
Solution of citrate of potash.......................	3 ounces

Give a teaspoonful in a little sweetened water every hour until the fever is reduced and the skin becomes moist.

CHICKEN-POX.

General Consideration.—Chicken-pox or varicella is a contagious disease having an eruption of vesicles. It generally occurs in children under six years of age, though it is sometimes seen in adults. One attack confers immunity from a recurrence in the same individual. From ten to seventeen days elapse after exposure to the contagion before the symptoms develop.

Symptoms.—Often the appearance of the eruption is the most marked symptom, although there is also slight fever which may be accompanied by chills, vomiting, headache and pain in the back and legs. The eruption comes out during the first day, usually appearing first on the chest or back, though sometimes on the forehead in the form of red spots. Later they are seen also on the extremities. They vary in number from one or two dozen to several hundred.

In the course of a few hours the papular spots become vesicular, filled with a turbid liquid, and these by the end of a day or so begin to dry. Fresh crops during the few days following continue to appear so that by the third or fourth day they may be seen in all stages of development.

Itching is often quite marked, and scars are apt to result if the patient is not prevented from scratching.

Diagnosis.—Failure to distinguish this disease from mild cases of small-pox has not unfrequently occurred. In the latter disease, however, the eruption does not appear until the third or fourth day of the disease, and it is first seen on the face and forehead. The vesicles are not present until the fifth or sixth day; they become depressed in the centre and by the eighth day become pustular, not beginning to dry until after this time. The eruption is not seen in different stages of development as in chicken-pox. It is quite frequent in small-pox also to observe in the beginning of the attacks rashes resembling those of scarlet fever and measles.

Nursing and Treatment.—A mild laxative and a simple fever remedy are all that are required. Five drops of sweet spirits of nitre in a little water every hour, if the fever is marked, will be sufficient. Most cases require no treatment except isolation.

The following contagious diseases differ from those already considered, in the fact that they occur without eruption, namely, diphtheria, whooping-cough and mumps.

DIPHTHERIA.

General Consideration.—This is a highly contagious constitutional disease, having a local manifestation in the form of a false membrane, which occurs either on the skin, or, more often, on the mucous membrane. Its usual locations are the throat, nose and larynx. The disease may be very mild or it may be extremely fatal. Different epidemics exhibit different degrees of virulence, and the cases occurring early in a given epidemic are usually the most severe. It is communicated by inoculation, by contact with the person affected, by means of the saliva, the pharyngeal secretions and portions of membrane; by exposure to the poison of the disease through the agency of infected clothing, bedding, apartments, and so forth, and through foul emanations. Defective sanitary conditions favor its development. Its occurrence is associated with the presence of a certain special germ which is supposed to be the cause of the disease. In some cases, however, the germ cannot be found; in others it is seen only early or only late in the disease; while again the germ may be found in the throats of those who present no constitutional or local symptoms of the affection. One attack does not confer immunity from another attack, and the symptoms develop from two to twelve days after exposure to the contagion.

Symptoms.—The initial symptoms are those ordinarily attending a slight cold, such as a feeling of fullness and irritation of the throat, accompanied by moderate fever, chilliness and general lassitude. Although it may be delayed for a day or two, usually within a few hours, examination of the throat reveals on the tonsils the presence of a small whitish-gray patch or patches of fibrinous exudate or false membrane, which spread with greater or less rapidity, often involving the pharynx and nose, and extending downward to the larynx, and so forth. The color soon becomes dirty gray or yellowish. If the membrane is removed new membrane rapidly forms in its place. With the progress of the case, if it is severe, the constitutional symptoms become more marked; the glands of the neck swell; delirium and stupor may occur; the heart becomes weak and there is every indication of profound blood poisoning. This may indeed be manifested quite early in the course of the disease. With these grave symptoms it is not infrequent for the temperature to be but slightly raised or even subnormal. The presence of a thick membrane is not necessarily indicative of the existence of a grave case, for severe symptoms are quite as apt to occur when the membrane is thin. There may be considerable destruction of tissue from the sloughing membrane giving rise to intense fetor.

When the membrane involves the larynx an additional element of danger confronts the patient in the mechanical obstruction of the air passages. The breathing is harsh and rasping, the voice often suppressed to a whisper, a brazen, croupy cough develops, pallor of the countenance and lividity of the lips may supervene, the patient struggles for air and unless speedily relieved death from suffocation occurs.

In the milder cases of tonsillar and pharyngeal diphtheria, after persisting for a few days, the membrane gradually disappears, coincident with which there is decided amelioration in the symptoms. Even in mild cases, paralysis of the muscles of the throat is quite apt to occur, causing difficulty in swallowing liquids, which often regurgitate through the nose. Renal complications sometimes occur.

Diagnosis.—1. Tonsillitis. In mild cases of diphtheria affecting the tonsils alone, it is difficult and sometimes impossible to distinguish them from cases of tonsillitis with exudation. As a rule, however, the thickness and gray color of the membrane, its tendency to spread, the glandular involvement and the general severity of the symptoms in diphtheria simplify the matter of diagnosis. The presence of the Klebs-Lœffler bacillus, the germ already alluded to, may be taken as confirmatory evidence of the disease.

2. Membranous Croup.—In the present state of knowledge it does not seem possible to differentiate with absolute certainty between membraneous croup which is non-infectious in character and which is probably relatively infrequent, and diphtheria affecting the larynx. The absence of constitutional symptoms and of local manifestations of diphtheria elsewhere, and inability to demonstrate the presence of the germ in portions of expectorated membrane are presumptive evidence of the non-contagiousness of the attack.

3. **Scarlet Fever.**—Cases of diphtheria sometimes occur in which there is an erythematous rash which may lead to confusion in diagnosing them from scarlet fever. For the points of distinction the reader is referred to the article on the latter disease.

Nursing.—The air of the room should be kept warm and moist, especially where there is a tendency to laryngeal involvement. Fresh air should be freely admitted and disinfectants employed to keep it pure. Pieces of ice may be allowed for the patient to suck and cold applications be made to the throat. Liquid nourishment should be systematically given.

Treatment.—1. In severe cases whiskey should be given every two or three hours in teaspoonful doses to sustain the vital forces.

2. The use of calomel and corrosive sublimate has its advocates, and while other plans of treatment are now more generally in use the benefit from their employment under suitable conditions seems incontrovertible. The writer has seen numerous cases in which the most violent symptoms, growing steadily worse, abated with surprising rapidity in response to the administration of from five to ten grains of calomel given hourly to a child until several characteristic movements of the bowels were produced. Corrosive sublimate in doses of about 1-100 grain have then been advantageously employed.

3. The local employment of lactic acid, one drachm to three ounces of lime-water, or of pancreatic extract, pepsin or vegetable pepsin, for the purpose of dissolving the membrane is advocated by some. Inasmuch, however, as the constitutional symptoms persist in spite of the removal of membrane and as its presence is usually not a menace to the patient the advantage of the practice is not apparent. It is of benefit, however, to use antiseptics locally. Peroxide of hydrogen diluted with an equal amount of water (may be used as a spray every hour or two) or weak solutions of formalin.

4. Iron and chlorate of potash have long been used, both for their local effect and their constitutional action. A mixture of this sort is of benefit:

Tincture of chloride of iron	1½	drachms
Chlorate of potash	48	grains
Glycerine	4	drachms
Water enough to make	3	ounces

Dissolve, and give a teaspoonful every two hours.

5. When the larynx is involved inhalations of the vapor of lime-water, especially in combination with liquor potassæ in the proportion of one drachm of the latter to one pint of the former, aid in dissolving the membrane. A blanket should be suspended over the bed in such a way as to form a tent, beneath which should be used a croup kettle or steam atomizer containing the liquid.

6. In cases which become progressively worse, and in which the signs of non-oxygenation of the blood indicate that death is imminent, tracheotomy in which the trachea is cut open, or intubation, in which, without cutting, a tube is inserted into the larynx through the mouth, will often save life if resorted to sufficiently early.

7. Tonics and reconstructives are needed in convalescence, and quinine, iron, arsenic and the hypophosphites, and the use of the most nutritious foods are indicated.

8. Antitoxin. Within the last few years the use of antitoxin, both as a means of prevention and of treatment, has been warmly debated. While its enthusiasts favor its employment in every case presenting symptoms of diphtheria, without even waiting to establish a diagnosis, in case doubt as to the character of the ailment exists, the more conservative men in the profession, who still have faith in its utility and efficacy, believe that the field for its employment should probably be limited to cases which present severe symptoms and to cases which do not respond promptly to ordinary methods of treatment. To procure good results, however, the remedy should be used before the vital forces are exhausted, or the blood profoundly poisoned.

The improved methods in the manufacture of this product and its increasing reliability are fast gaining advocates for its more universal adoption.

In a child over two years of age from 1,000 to 1,500 units is the usual dose, or if the case is very severe, 2,000 units. The serum is very slowly injected beneath the skin, in the loose cellular tissue, preferably at the side of the abdomen, and allowed to be absorbed without friction. In from twelve to eighteen hours the dose is repeated if there is no improvement, and a third dose, usually of one-half the amount first used, may even be necessary. As an immunizing agent 1,000 units may be employed. The immunity conferred does not last a great while, probably less than thirty days, so that with new exposures, repeated immunization is necessary.

WHOOPING-COUGH.

General Consideration.—Whooping-cough or pertussis is a contagious disease, mainly of childhood, characterized by catarrh of the air passages and a significant cough. It is communicable from person to person by the breath and bodily exhalations and by the agency of apartments which have become infected. It is not the harmless disease which it is so often regarded as being, for aside from the deaths which result from the disease itself, there are very many which are indirectly traceable to it, owing to complications and the after-effects of the disease.

Symptoms.—For a week or ten days these are the symptoms of an ordinary cold, with cough, slight fever, and so forth. The cough gradually increases in severity and assumes the spasmodic character which gives to the disease its name. The paroxysms consist of a series of short expulsive coughs, in which the child often becomes blue in the face and apparently on the verge of suffocation, when a long drawn noisy, whooping inspiration occurs. Thick stringy mucus is expectorated, often with vomiting, and sometimes with hemorrhages from the nose, lungs, and so forth. Several of the attacks may follow each other in close succession and then a respite of varying length occurs. After several weeks the paroxysms become less frequent and less violent, and finally cease, although for many months mild attacks may be induced by transient colds, crying, and so forth. While one attack usually confers immunity, it is frequent for other members of the family in which the disease occurs to be affected by a nervous cough, closely simulating the true disease.

Nursing.—Except in very severe cases, with complications, or where the patient becomes exhausted from loss of food, it is not necessary to confine him to the bed or the house. An abundance of fresh air is desirable, although this must be secured without exposing other children to the danger of infection.

Treatment.—1. Inhalations by means of a steam atomizer or croup kettle, of medicated steam often afford relief to the paroxysms, limiting their frequency and severity. For this purpose carbolic acid, which may be advantageously combined with an alkali is recommended, as in the following formula, used by Dr. J. Lewis Smith, late of New York, and Dr. John M. Keating, late of Philadelphia:

Crystallized carbolic acid	3	grains
Borax	20	"
Bicarbonate of soda	20	"
Glycerine	1	ounce
Water	1	"

Some of the crude coal tar products, such as cresol, have proved markedly beneficial by inhalation.

2. Internally, belladonna has long been employed with a fair measure of success. For a child of five years, six or eight drops of the tincture should be given night and morning, until the characteristic dryness of the throat is produced.

3. Antipyrine in doses of three or four grains several times daily is often helpful, but must be given with care on account of its depressing effect on the heart.

4. Bromide of potash, from three to five grains, every three hours is useful where the nervous element of the disease is prominent.

5. Bromoform, a drop for each year of the child's age given every three or four hours, is one of the most satisfactory of the more modern remedies.

MUMPS.

General Consideration.—Mumps, parotitis or parotiditis, is an infectious disease in which inflammation and swelling of the parotid gland occurs. Its symptoms develop from twelve to twenty-one days after exposure to the contagion. Unless complications occur, it is not a serious malady.

Symptoms.—Slight fever, swelling and tenderness of the parotid, and sometimes submaxillary and sublingual glands, with or without pain, are the main symptoms. The swelling extends both in front of and behind the ear, and eating, swallowing and even speaking may be difficult. The secretion of saliva is at times increased, at others, diminished. Either one or both sides may be affected, and in the former cases the immunity which is conferred by one attack is limited to the side which was involved. After lasting for a week or ten days, recovery rapidly takes place. Among the complications are the occurrence of orchitis and occasionally of mastitis.

Nursing.—Care should be taken to avoid exposure to cold and the patient should be fed on liquid and soft foods.

Treatment.—Nothing more than a mild laxative and a slight fever mixture is required. Either heat or cold, whichever is most comfortable, may be applied, and an ointment of ichthyol and lanoline one part to four.

MISCELLANEOUS DISEASES.

In addition to the contagious diseases, both eruptive and non-eruptive, are several which, though not confined exclusively to children, occur so often in them as to require consideration.

ST. VITUS' DANCE.

General Consideration.—St. Vitus' dance, or chorea, is a disease of the nervous system, characterized by involuntary and irregular muscular movements, without consciousness being suspended. There is a marked connection between this disease and the occurrence of acute rheumatic fever or inflammatory rheumatism and of endocarditis, or inflammation of the membrane lining the heart's cavities. It more frequently is seen in those having a pronounced nervous temperament and there appears often to be a family predisposition to the disease.

Strong emotional occurrences, such as deep grief, fright, and so forth, are sometimes the exciting causes, as are also great nervous strain and mental application.

Symptoms.—Every effort of the patient to perform a voluntary muscular act is attended by irregular spasmodic movements, over which he has no control, and the stronger the effort made, the more pronounced is this condition. The symptoms generally come on gradually, though sometimes suddenly, beginning usually in the hands and arms and extending to the face and legs. One or both sides may be involved and the movements may be general or confined to a few muscles. During sleep they are rarely continued. The disease may last for a few weeks only, or may persist in spite of treatment for many months or even years. It frequently recurs, especially in the spring of the year.

Nursing.—1. Rest in bed, quiet and separation from those members of the family who are not actually engaged in taking care of the patient should be secured. The general improvement of nutrition by means of good food and tonics should be aimed at and efforts made to overcome any impairment of the digestive function. After a few days of rest, which in very severe cases may have to be obtained by gentle restraint of the active muscles, massage and carefully regulated Swedish movements will be of advantage. Spraying the spine with ether is sometimes beneficial.

2. Iron in assimilable form, as the peptonate, is useful. The arseniate of iron in doses of 1-100 of a grain or more three or four times a day is an eligible preparation.

3. Arsenic in the form of Fowler's solution (liquor potassæ arsenitis) is more employed than any remedy. For a child of eight years five drops may be given in water three times a day after meals, and the amount increased until the constitutional effect is produced.

4. Strychnine has also been employed in many cases with good results. Beginning with a dose of 1-150 of a grain it may be increased until its physiological effects are noticeable.

INCONTINENCE OF URINE (Wetting the Bed).

General Considerations.—Incontinence of urine or eneuresis is a disease frequently occurring in children, both in acute and chronic form.

Sometimes due to malformations of the bladder it is more often caused by irritation due to too great acidity of the urine, stone in the bladder, phimosis and the presence in the rectum of worms or of a fissure. Or it may be due to weakness of the muscles of the sphincter controlling the bladder, to their being in an irritable condition, or to an excessive secretion of urine. It is the form occurring at night with which we are particularly concerned.

Treatment—Manifestly the treatment must depend on the condition present.

1. Too great acidity is readily cured by administering liquor potassæ (solution of potash) in five-drop doses every three hours in a wineglassful of water, and continuing it for a while after the urine has become neutral or alkaline in reaction.

2. Where there is too great contractile power of the muscles, belladonna should be given in five-drop doses of the tincture, at bed-time, to a child of five years, to be increased if not productive of good results until pronounced dryness of the throat occurs. If it is beneficial it may have to be continued for some time to avoid a relapse.

3. Where there is a lack of tone to the muscles, extract of nux vomica and ergot are often useful.

4. An excessive amount of urine may be controlled by limiting the fluids taken before retiring for the night.

5. The other causes of incontinence must receive their appropriate treatment.

WORMS.

General Considerations.—Several forms of worms infest the intestinal tract, the most common of which, in this country, are the "round worm," "thread worm" and "tape worm."

Round Worms.—The round worm or ascaris lumbricoids is reddish or yellowish-red in color and cylindrical in shape, with tapering extremities, resembling somewhat the ordinary earth worm. From the intestinal canal it may travel to any part of the alimentary tract, and has been found in other parts of the body. They may occur singly or in large numbers.

Thread Worms.—The thread worm, pin worn or oxyuris vermicularis is a small whitish worm inhabiting the rectum and colon.

Tape Worm.—Of tape worms there are two kinds common in man, the tænia solium or pork tape worm and the tænia saginata or beef tape worm. The latter is the larger, often being twenty or more feet in length. Its head is provided with "suckers," by means of which it adheres to the mucous membrane of the intestine; the pork worm has also hooks which it inserts and secures a firmer hold. The entire body may be cast off, yet if the head remains a new body will grow in the course of a few months to as large a size as the first. The body is composed of small flat segments, appearing like a piece of tape marked into squares or oblongs. Separate segments or continuous ribbons of segments are often passed and are for a short time endowed with slight motility.

Symptoms.—Various nervous and digestive disturbances may be produced by the presence of worms, or there may be no constitutional symptoms whatever. The thread worm causes intense itching in the rectum, especially at night.

Treatment.—**1. Round Worms.**—Santonin, three grains, or given in divided doses, followed by a saline laxative or a dose of calomel, is one of the most satisfactory plans of treatment. It may need to be repeated on several successive days.

2. Thread Worms.—Santonin and laxatives are also useful in treating this form of worn. Injections of quassia and water (a handful to a quart), of salt water or of carbolic acid and water (ten grains to a pint) are also advisable.

3. Tape Worm.—For two days before beginning the treatment the diet should be light, and for a full day only milk with a little bread should be allowed. A laxative should be given, and on the following day a drachm or two of the oil of male fern, preferably in capsules. This should be followed in about two hours by a dose of castor oil or of citrate of magnesia.

When the worm is passed careful examination should be made for the head. An infusion of pomegranate root, or its active principle pelletierine, is also one of the best remedies known. Or three or four ounces of pumpkin seeds may be bruised, soaked for twelve hours in water, and the liquid, or preferably the entire preparation, taken at once.

CURATIVE MEDICINE.

PART XIII.

SURGICAL DISEASES.

BACTERIOLOGY, INFLAMMATIONS, CONTUSIONS, WOUNDS, ACCIDENTS, EMERGENCIES, ULCERS, ABSCESSES, ETC.

Bacteriology.—Bacteriology is the science which treats of germs. Their discovery within a few decades has wrought a revolution in surgical treatment. No intelligent understanding can be had of the principles of surgery without at least some elementary knowledge of bacteriology. For its more complete discussion see the special article upon the subject.

Micro-Organisms, Germs, Bacteria or Microbes are minute vegetable cells, most of which can be seen by the microscope only. They are widely distributed, being in the air we breathe, food, water, in the soil, on vegetable and animal matter either living or dead. They form a microscopic flora, a vast vegetable world, with varieties probably as innumerable as the vegetation with which we are so familiar. Some microbes when introduced into the system are non-disease producing, harmless. Others are pathogenic or disease producing, most virulent in their action.

Yeasts include several species of germs, the action of which, in bread raising and in producing alcoholic fermentation, is familiar. They are, for the most part, harmless to the human system; one variety, however, grows upon the mucous membrane as thrush.

Molds represent another class, familiar to us in their growth upon old leather and upon stale bread.

Bacteria.—The sub-class of germs known as bacteria are the ones of chief interest to the surgeon. Of the three forms, coccus, berry-shaped or round; bacillus, rod-shaped, and spirillum, corkscrew-shaped; the latter plays no rôle in surgery.

Growth of Bacteria.—Bacteria may multiply with amazing rapidity. Under ideal conditions a single cell in one day will have sixteen million descendants, and in three days the mass of new cells would weigh 7,500 tons. Multiplication is chiefly by subdivision, one cell dividing into two, the two into four and so on; or by "seeds," called spores.

Soil for Bacteria.—They require a suitable substance or "soil." Some grow better upon living matter, others upon dead. Most of them are readily grown artificially upon the blood serum of an animal, a suggestion as to the favorableness of the human tissues for a soil. They need heat and require water. Most grow better when exposed to the oxygen of the air, but a few better when air is excluded.

Lock-Jaw.—The bacillus of tetanus or "lock-jaw," is one of the latter class. The dust of out-buildings, the soil of gardens are favorable places for the growth of the tetanus bacillus. "Rusty" nails are common about such places. A wound is received by such a nail. The patient possibly develops lock-jaw, not because (as is popularly believed) the nail was rusty, but because, among the minute particles of dirt upon the instrument were the germs of the disease. The depths of this small wound, the superficial tissues closing and excluding the air, thus give a most favorable nidus for the growth of the tetanus bacillus.

Sunlight and Bacteria.—Sunlight antagonizes the growth of most germs. Temperature is a most important factor. The body temperature is a favorable one for many pathogenic germs. Freezing, or even a temperature of 200 degrees Fahrenheit below zero, does not kill bacteria, but only arrests their growth. Favorable temperature will again restore their activity. High temperature, on the contrary, destroys them. The Jewish idea of purification by fire was based upon a scientific fact. As a practical fact boiling water kills in a few minutes most disease-producing and death-dealing germs.

Special Surgical Germs.—There are quite a known number of germs which are particularly the surgeon's enemies. Such are the following:

Pus-Producing Germs.—Pus-producing (pus being commonly called "matter") microörganisms, of which there is a large variety of cocci, must always be reckoned with. It must be understood that pus can be formed only by the presence, growth and action upon the tissues of some of this variety of germs. The formation of pus is called suppuration; the term purulent means pus-like or forming pus.

The Bacillus of Tuberculosis forms "cold" abscesses, produces "white swelling," Pott's disease, "scrofulous" conditions, besides the dread disease of consumption of the lungs. There is not a tissue of the human body which it may not ravage.

The Coccus of Erysipelas, the coccus of gonorrhea, the bacillus of tetanus, the bacillus of syphilis are common combatants of the surgeon.

Introduction of Microbes into the System.—A most important and practical question arises, How do disease-producing germs gain entrance into the living tissues? We daily breathe, eat and drink germs and are clothed in them. All common objects, including clothing, coming in contact with the skin, deposit bacteria upon it, so that unless rendered free from them, by special means, there is no portion of the skin upon which they do not exist. Keen says that the hands of the bride at the altar are surgically filthy.

Abundance of Germs.—Germs being plentiful in air, food and drink there is scarcely any portion of the lining or mucous membrane of the alimentary (food) canal or of the respiratory passages but what is in contact with them. Let the skin and mucous membrane be healthy and very few microbes enter the tissues; they are cast off harmlessly. But let there be inflammation or some unhealthy state of the surface, especially some "raw" spot, though ever so little, a prick, a scratch, the slightest break of skin or mucous membrane and the door is wide open for the entrance of the host.

Tissues that Assist Germs.—Providentially, certain tissue elements, notably the white blood cells and blood serum, have great capability of destroying germs which gain ingress into the system. "There is a battle royal between the invading host of germs on the one side and these defensive elements upon the other." If, for a time, the germs gain the ascendency, manufacturing their poisonous products, as they do, the subject is ill. Whenever the protective elements are conquerors the subject remains unharmed—in health. If, for any reason, a person becomes debilitated, the germ killing power of the tissue cells is less vigorous; if any portion of the body becomes injured this reduces the cell vitality at such site. The latter conditions thus render the tissues a favorable soil for germ growth.

Definition of Terms.—A germicide or disinfectant is an agent fatal to bacteria. The destruction of germs in clothing, in excrement, in a wound, on the hands, and so forth, is called disinfection. Disinfection of a wound, dressings or instruments is called sterilization. An antiseptic is an agent which retards or prevents the growth of germs. By sepsis or infection is commonly meant a condition in which disease-producing germs are present, *e. g.*, a septic or infected wound. Asepsis means, commonly, the absence of bacteria.

Disinfection or Sterilization.—The paramount object of the surgeon in every operation to-day is to have the field of operation and all objects coming in contact with the wound as free from bacteria as may be—to do an aseptic operation. If the area of operation is already infected, for example, an abscess to be opened, he uses the antiseptic method. Three means of sterilization are available, as follows:

1. **Thermal Disinfection** consists in the use of heat in the form of boiling water, steam or hot air. By this means everything concerned in an operation may be sterilized except the skin of the patient and the operator's hands. In a modern hospital special sterilizers are used in which dressings, towels, sheets, operating gowns and so forth, are subjected to steam under high pressure. These articles, wrapped in sheets or placed in sterile jars, are not disturbed until the time of operation and are then handled with sterile hands. As a practical fact, simple boiling for fifteen minutes is a most efficient method of sterilizing, and the one which is universally used for instruments. Any clean, flat pan may be used for boiling the instruments. A teaspoonful of cooking soda to the pint of water should be added.

2. **Chemical Disinfection.**—Many chemicals will kill bacteria, but the most reliable and the one most common is bichloride of mercury or corrosive sublimate. (Bear in mind that it is a rank poison.) It is used in the strength of 1 part of the drug to 1,000, 2,000 or more of water. Seven and a half grains make, when added to a pint of water, a 1 to 1,000 solution. It is put up in tablets each one containing seven and a half grains. Needless to say it is not used upon mucous or serous membranes except in very weak solutions (1 to 4,000 or more). It cannot be used for the sterilization of instruments as it corrodes all metallic substances.

Carbolic Acid is valuable as a germicide in the strength of 1 to 40 or 1 to 20 parts of water. In such strength of the solution instruments are sometimes placed during operation, and it is occasionally used in cleaning the skin.

Creolin and Lysol may be used in one per cent. or two per cent. solutions upon the skin or instruments, but are chiefly employed in the former strength for vaginal and uterine douching.

Hydrogen Peroxide is an excellent agent for cleansing infected wounds. The common form should be diluted one-half or two-thirds. It is most conveniently used with an atomizer.

Normal Salt Solution, made by adding a teaspoonful of table salt to each pint of water and boiling to sterilize, is mildly antiseptic in action. It is much used for flushing out cavities of the body, *e. g.*, the abdomen where strong antiseptics are injurious. It is often used with great advantage to cleanse large superficial wounds, such as burns or to saturate dressings applied wet. As a simple ready household remedy for cleansing wounds, gargling the throat, and so forth, it is frequently valuable.

Boric Acid in a saturated solution (fifteen grains to the ounce of water) is mildly antiseptic and is very commonly employed for cleansing wounds of the mouth, nose, for washing the eye in inflammations. It is a useful remedy and may be employed freely with impunity upon the most delicate tissues. In the form of powder it is frequently, with good effect, applied to cuts or other wounds.

Iodoform, in powder, is a valuable antiseptic and is much used for dusting purulent or suppurating areas. It is particularly useful in tuberculous foci. Cheese-cloth impregnated with it is largely used for draining wounds, keeping abscesses open, for packing cavities to arrest the oozing of blood.

Acetanilid, a white powder, is a fair substitute for iodoform, except that it probably does not benefit tuberculous conditions.

3. Mechanical Disinfection.—This consists practically of thorough washing with soap and warm sterile water. It will be described in detail under the next heading.

Preparations for an Operation.—The patient should be prepared the day previous. Suggestions for such preparation are found in the chapter upon Anesthesia. A room for operation should contain as little as is essential for the necessities of the case. Some graver operations, such as those upon brain, lungs or abdominal cavity had much better be done in a hospital with all modern equipments and conveniences. However, the room of a private house may be rendered fit.

A Fit Operating-Room.—A room should be well lighted and ventilated and warm. The day before operation curtains, all hangings and carpets should be removed. The floor must be thoroughly scrubbed, the walls and ceiling brushed, or better, washed. Air, unless dust-laden, does not carry germs in sufficient numbers to infect the wound seriously. The room is to be well aired and dried. The day of operation a table (a kitchen table does well) is provided for the patient upon which are placed a folded comfortable or folded blankets. A rug or piece of carpet is spread beneath the table.

Other Preparations.—Two or three other tables or stands are placed near for instruments, basins and dressings. Buckets for the slops should be placed near. Several gallons of water thoroughly boiled must be provided. A portion should be hot, but much of it should be cooled by setting it aside in clean vessels under cover. A half dozen clean sheets and a dozen small towels should be at hand. A stove furnishes heat for boiling the pan containing instruments.

The Surgeon's Preparation.—The surgeon and his assistants remove their coats and roll the sleeves above the elbows. The hands and arms are to be freed so far as possible from germs—to be disinfected. A common and good method is as follows: Trim the nails short, clean well under them, removing also any excess of skin at the roots. Scrub the hands and forearms very thoroughly for five minutes or more with hot sterile water and a good soap, such as castile. A nail brush must be used; scrub very carefully about and under the nails and between the fingers. Give particular care to the creases of the hands. The nails are again cleaned with a knife and the hands afterward scrubbed. The hands are now thoroughly washed in plain sterile water and had better be dipped in alcohol for a few moments. The hands are last scrubbed for at least a minute in bichloride of mercury, 1 to 1,000, careful attention being given to the region of the nails.

The surgeon and assistants now envelop themselves in sterile gowns and scrupulously avoid touching any object which has not been sterilized.

The Assistant's Duty.—Meanwhile one assistant has sterilized the skin of the patient. The field of operation, including a wide area about the place of incision, should have been, the day before, shaved if hairy, sterilized, and meanwhile protected with sterile dressing. Whether so or not, the part, by the method used for the surgeon's hands, is disinfected immediately preceding operation. Sterile sheets and towels are now spread over the patient about the area of operation, leaving only a small portion exposed. With sterilized instruments and sponges (the latter preferably being a small strip of cheese-cloth rolled into a mass) sterilized material for tying blood-vessels and suturing the wound, the surgeon is disappointed if he does not have an aseptic wound—one that heals readily without pus formation. In such an operation chemical antiseptics, which are irritant, are avoided. If, however, a purulent condition existed prior to operation, *e. g.*, an abscess, chemical disinfectants, notably corrosive sublimate solution, are, in addition to the former method, freely used, and the wound is probably left wide open for drainage of the pus.

Infection of Wounds.—Any wound accidentally received is infected, from the instrument wounding, from clothing, soil ground into it, in fact, anything coming in contact with it. One object of highest importance is the disinfection of such wound. For further discussion see Wounds.

Tying and Sewing Wounds.—For tying or ligating blood-vessels, silk or catgut, usually the latter, is used. For sewing or suturing a wound, catgut, silk, silk-worm gut, or silver wire are common. Catgut must be prepared by a special process. The other material is best sterilized by boiling.

Dressings for Wounds.—Dressings may be made of any material which readily absorbs wound fluids. Cheese-cloth is best. This, together with gowns, sheets and towels is not readily prepared without special sterilizers. In emergency, however, after boiling, drying and wrapping them in sheets or towels they may be baked. Or clean unsterilized sheets and towels may be wrung out of bichloride of mercury solution and thus, damp, be put about the site of operation. Unsterilized dressings may be treated likewise, and so placed upon the wound.

CONTUSIONS AND WOUNDS.

Contusions.—By a contusion or bruise is meant the crushing or laceration of tissues beneath the skin, the latter remaining unbroken. Blood is poured out into the injured tissue making it "black and blue." The effused blood will, as a rule, be gradually absorbed and the injured tissue restored. Suppuration or gangrene rarely occurs.

Symptoms.—The symptoms are swelling, tenderness, numbness, followed by aching pain. Discoloration sooner or later appears. Loss of function may occur, and, in severe contusions, shock may be great.

Treatment.—If shock is present, reaction from it should be secured by rest in bed, stimulation and external heat. Rest and elevation of the injured part are of prime importance. Application of cold is indicated, except in very grave contusions, and in the feeble and aged. Heat, instead, is indicated in such cases. Compression by firm bandage is useful for the arrest of hemorrhage and to antagonize swelling.

Accessory Treatment.—The constitutional treatment is the same as that for inflammation. Massage, liniments, applications of ichthyol ointment and motion are essential in the late stages of contusions.

Wounds.—A wound is an injury in which there is a break or division of the tissues by some sudden force. In the sense here used, the term includes tearing or dividing of the skin. Wounds comprise cuts, stabs, gunshot wounds, bruised and torn wounds, poisoned wounds, and so forth.

Danger from Wounds.—The danger of a wound depends upon its depth and size, and above all upon the importance of the underlying parts involved, such as arteries and nerves, or vital organs, such as the heart and lungs. Stabs and gunshot wounds are generally far more dangerous than would appear from their size, because they are apt to involve vital portions of the frame, and also because pieces of the weapon or of the bullet may be left remaining in the wound, as was the case with the lamented President Garfield.

Healing of Wounds.—The healing of wounds occurs in two ways:

By First Intention.—In the first place, a wound may heal by primary union, or, as it is also called, union by the first intention, without the formation of any pus or matter, and leaving only a very fine line-like scar. This mode of healing should always be sought for, but can seldom be obtained, except under the following conditions, to wit: when the sides of the wound can be accurately fitted together, and are not subsequently displaced by bleeding or the exudation of matter, also when the wound is left quiet and protected from outward injury, and when it is kept free from impurity.

Healing by Second Intention.—The second mode of healing takes place slowly, with suppuration and the formation of little rounded knobs, called granulations, all over the raw surface, and leaves a large, red scar, ultimately becoming dead white. This second and far inferior method of healing is observed when the favorable conditions just mentioned are absent, as for example, first, when so much of the skin has been destroyed that the edges of a wound cannot be brought together, as in wounds caused by cannon balls or shells, in scalp wounds from blunt instruments, or where the edges of wounds are so torn and bruised that their life is crushed out; second, where the edges of wounds are separated after they were adjusted, by blood being effused, or by the formation of pus; third, when the injured parts have been disturbed, as, for instance, in the leg, by standing or walking, or the hand and arm by working, and so forth; or, if the wounded party has been badly transported from the scene of the accident; or, lastly, when the wound was dirty and had not been properly cleansed or disinfected, because want of cleanliness leads directly to putrefaction and the formation of pus, and it is especially the matter formed in the process of suppuration which separates the sides of wounds and prevents their healing by the first intention.

Proud Flesh.—When the wound does begin to heal in the second and inferior method, granulations form, which are often called proud flesh, and are especially dreaded by ignorant persons as dangerous intruders into a sore. These granulations by degrees organize into a living tissue of great firmness, and after they have filled up the cavity of the wound to the level of the surrounding cutaneous surface, or sometimes a little above it, they cover themselves with epidermis and constitute a scar.

Symptoms.—The symptoms of a wound are constitutional and local. The constitutional or general effect of a serious wound is called shock. In shock, sudden depression of the vital powers occurs. There is general

FIGURE 1.

HOW TO STOP BLEEDING FROM WOUNDS.

The Emergency.—In case of severely bleeding wounds, quick work is required to save life. One must know not only what to do, but how to do it.

The Arrows.—The arrows in the adjoining plate show the places on the body where pressure is to be made in order to stop the flow of blood.

Kinds of Pressure.—In ordinary wounds the pressure may be found sufficient when made with the index finger or the thumb. In severe wounds, and where the arteries or veins lie deep, the firm pressure of both thumbs may be required. And where the wounds are still more severe, or pressure with the thumbs becomes tiresome, resort may be had to a large key, or better still, to the familiar and effective appliance known as the *Spanish windlass*, or to the *tourniquet* made of a strap, cord or handkerchief. For a full description of "How to Arrest Bleeding" by exerting pressure, see pages 656-668.

Places of Pressure.—1. If the wound is upon the forehead, place the index finger or thumb upon the spot indicated by the head of the "*forehead*" arrow, and exert firm pressure.

2. If the wound is upon the scalp, place the index finger or thumb upon the spot indicated by the head of the "*scalp*" arrow, and press firmly.

3. If the wound be upon the face, place the index finger or thumb upon the spot indicated by the head of the "*face*" arrow, and make firm pressure.

4. If the wound be upon the head or upper part of the neck, in other words, above the shoulders, the pressure must be made on the spot indicated by the head of the "*neck and head*" arrow. Press hard and constantly.

5. If the wound be on the arm, make the pressure on the inside of the arm, at the spot indicated by the head of the "*arm*" arrow. This pressure will stop the bleeding of a wound anywhere below the neck and above the heart, but it must be made on the inside of the arm nearest the wound.

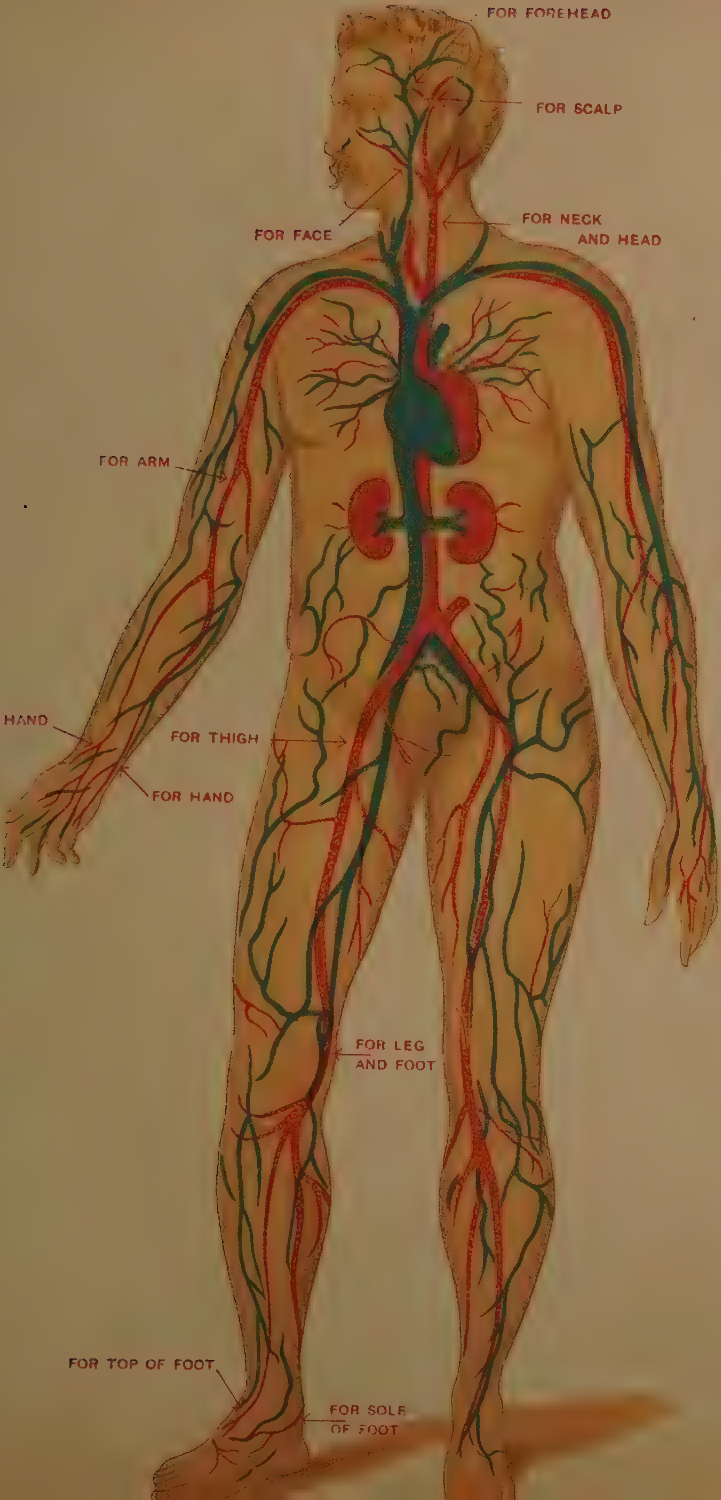
6. If the wound be on the hand, make the pressure on the places indicated by the heads of the "*hand*" arrows.

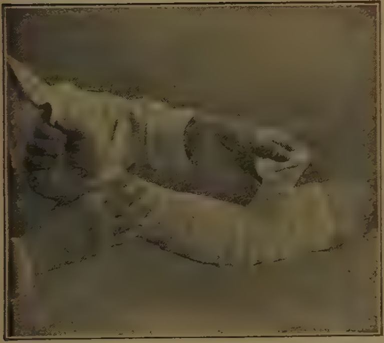
7. If the wound be on the body anywhere below the region of the heart, the pressure must be exerted very firmly (see page 661) on the inside of the thigh, at the point indicated by the head of the "*thigh*" arrow.

8. If the wound be on the lower leg or foot, the pressure must be made on the spot indicated by the head of the "*leg and foot*" arrow.

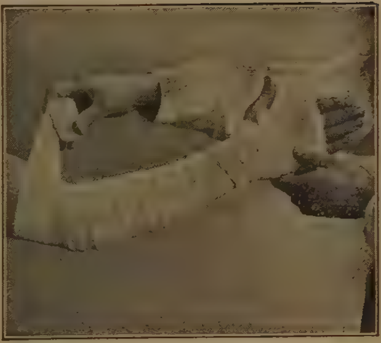
9. If the wound be on the top of the foot, make the pressure at the spot indicated by the head of the "*top of foot*" arrow.

10. If the wound be on the sole of the foot, make the pressure on the spot indicated by the head of the "*sole of foot*" arrow.

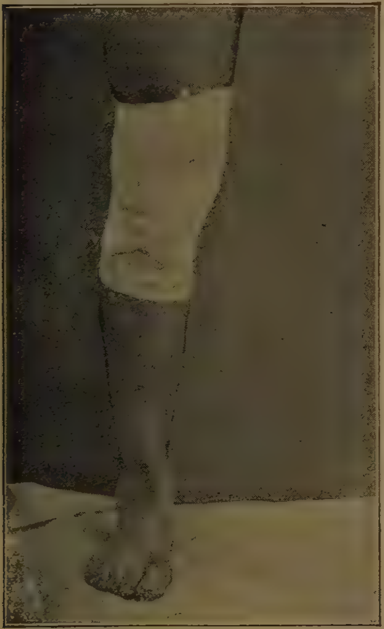

FOR FOREHEAD
FOR SCALP
FOR FACE
FOR NECK AND HEAD
FOR ARM
FOR HAND
FOR THIGH
FOR HAND
FOR LEG AND FOOT
FOR TOP OF FOOT
FOR SOLE OF FOOT



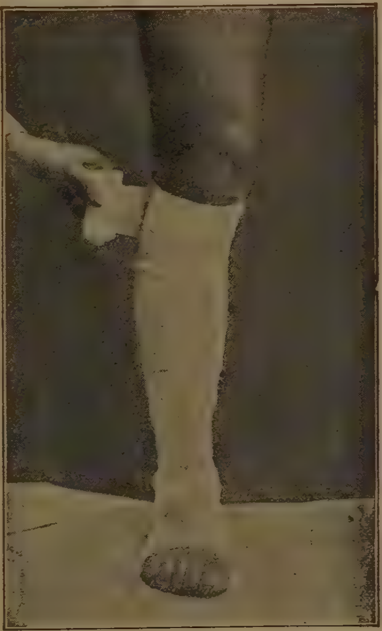
WOUNDS AND EMERGENCIES.—Actual photograph of bandage used in case of a burn on front part of hand, wrist or forearm. See Index.



WOUNDS AND EMERGENCIES.—Actual photograph of bandage used in case of a burn on back of hand, wrist or forearm. See page 683.

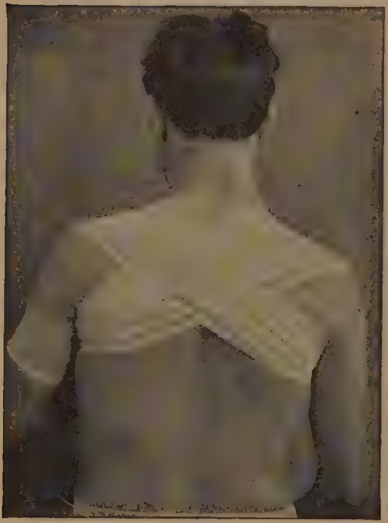


WOUNDS AND EMERGENCIES.—Actual photograph of bandage used for fractured kneecap and steadying joint motion. See Index.

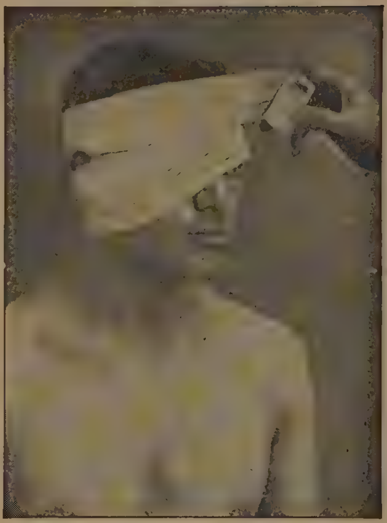


WOUNDS AND EMERGENCIES.—Actual photograph of bandage used in case of a serious wound on lower part of the leg. See page 683.

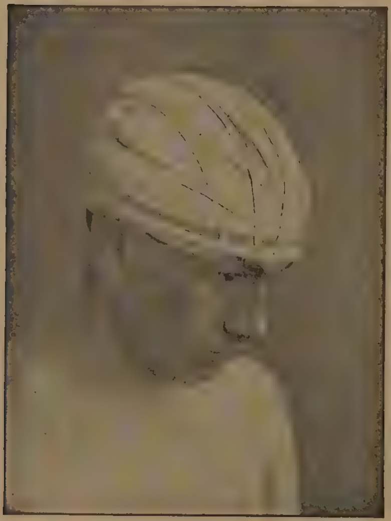
Hardly an emergency arises that bandages are not needed to give relief and save life. How to apply them so as to stop bleeding, close up wounds, hold fractures and reduce sprains and dislocations, is an art everyone should know. It is easily learned from the diagrams and photographs.



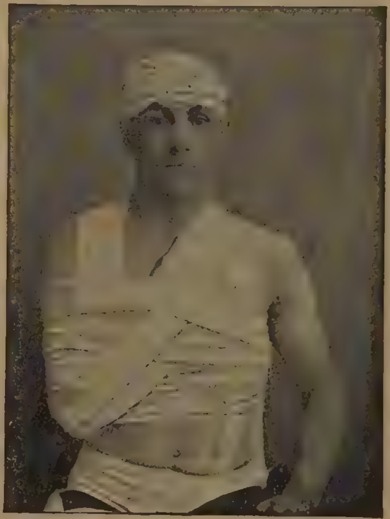
WOUNDS AND EMERGENCIES.—Actual photograph of bandage used to fix the shoulders back in case of a burn on breast, or broken collar bone. See page 693.



WOUNDS AND EMERGENCIES.—Actual photograph of bandage for serious injury to the eye, to retain dressing and exclude light. See page 689.



WOUNDS AND EMERGENCIES.—Actual photograph of a simple and effective bandage for dressing wounds of the scalp, or any injury of the top or sides of the head. See Index.



WOUNDS AND EMERGENCIES.—Actual photograph of bandage for fractured collar bone, so applied that it cannot be removed by a restless patient. See page 692.

THE BANDAGE is the handiest and mightiest of factors in cases of accidents and emergencies. Its quick and ready use saves suffering, deformity and life itself. The diagrams and photographs explain the manner of applying bandages to meet emergencies.

weakness; a faintness, with sometimes loss of consciousness; the pulse is feeble and rapid; skin pale, cold and clammy; the bodily temperature is lowered; nausea with vomiting may occur. Loss of blood may be a strong factor in producing shock.

Reaction from Shock.—During and following the arrest of hemorrhage, reaction from shock is to be sought by raising the feet and lowering the head; at least place the head flat, and the lower extremities quite as high as the head; wrap the patient in warm blankets and surround him with hot bottles, hot bricks, and so forth.

Stimulants.—A tablespoonful of whiskey or brandy may be given by mouth every half hour. An enema of black coffee one-quarter pint and whiskey two tablespoonfuls is excellent. Injections under the skin of whiskey, strychnine, digitalis, are invaluable. In the graver forms the injection of large quantities of warm normal salt solution beneath the skin, into the bowel or into the veins should be practiced.

Local Symptoms.—These are hemorrhage, pain, loss of function and gaping of the wound edges.

Treatment of Wounds.—The steps in treatment of a severe wound are given in order as follows:

Arrest of Hemorrhage.—The fact that hemorrhage may readily prove fatal, or, as it is popularly phrased, the person may easily bleed to death, is so important that a detailed discussion is needful. Every wound bleeds, because in every wound blood-vessels are injured. But the kind of hemorrhage, as well as its danger, varies with the size and the nature of the blood-vessels which have been divided. If the blood does not flow freely, but trickles from the wound, one may conclude that only small blood-vessels have been severed. When dark blood wells out in a steady stream, and when the flow is increased by pressure above the injured spot, that is, nearer the heart of the patient, a large vein has been opened. Lastly, when bright, red jets spurt out of the wound, forcibly, and in jerks, an artery is divided and danger to life is great and immediate.

Smaller Wounds.—Unimportant hemorrhages from very minute arteries, and from veins of only moderate size, can generally be arrested by pressure upon the wound itself, or by pressing the sides of the cut against each other, or it may stop of its own accord in consequence of the mouths of the vessels contracting and the blood in the wound coagulating into a tough, viscid mass.

Hemorrhage from an injured vein, as, for example, that from the giving way of a varicose vein in the leg, is sometimes difficult to check, on account of the pressure of some light article of clothing, such as a garter,

FIGURE 2.

MAD DOG OR POISONOUS REPTILE BITES.

What to Do.—This class of common and dangerous emergencies may be successfully met on the moment by the simple means shown in the adjoining plate. By preventing the poison from entering the system, time is gained for the use of the remedies given on pages 365, 664, 1034.

The Band.—The band, fillet or ligature used may be a strap, cord, rope or handkerchief—anything, in fact, which can be drawn and tied tightly; or which, if tied loosely, will permit of a stick being placed within it, and a tight twisting of the same, after the manner of a *tourniquet* (see page 660), in order to stop the blood circulation more effectively.

How to Do.—1. If the bite be on the arm, bind the cord, or ligature, tightly around the limb at the point indicated by the head of the "*arm*" arrow.

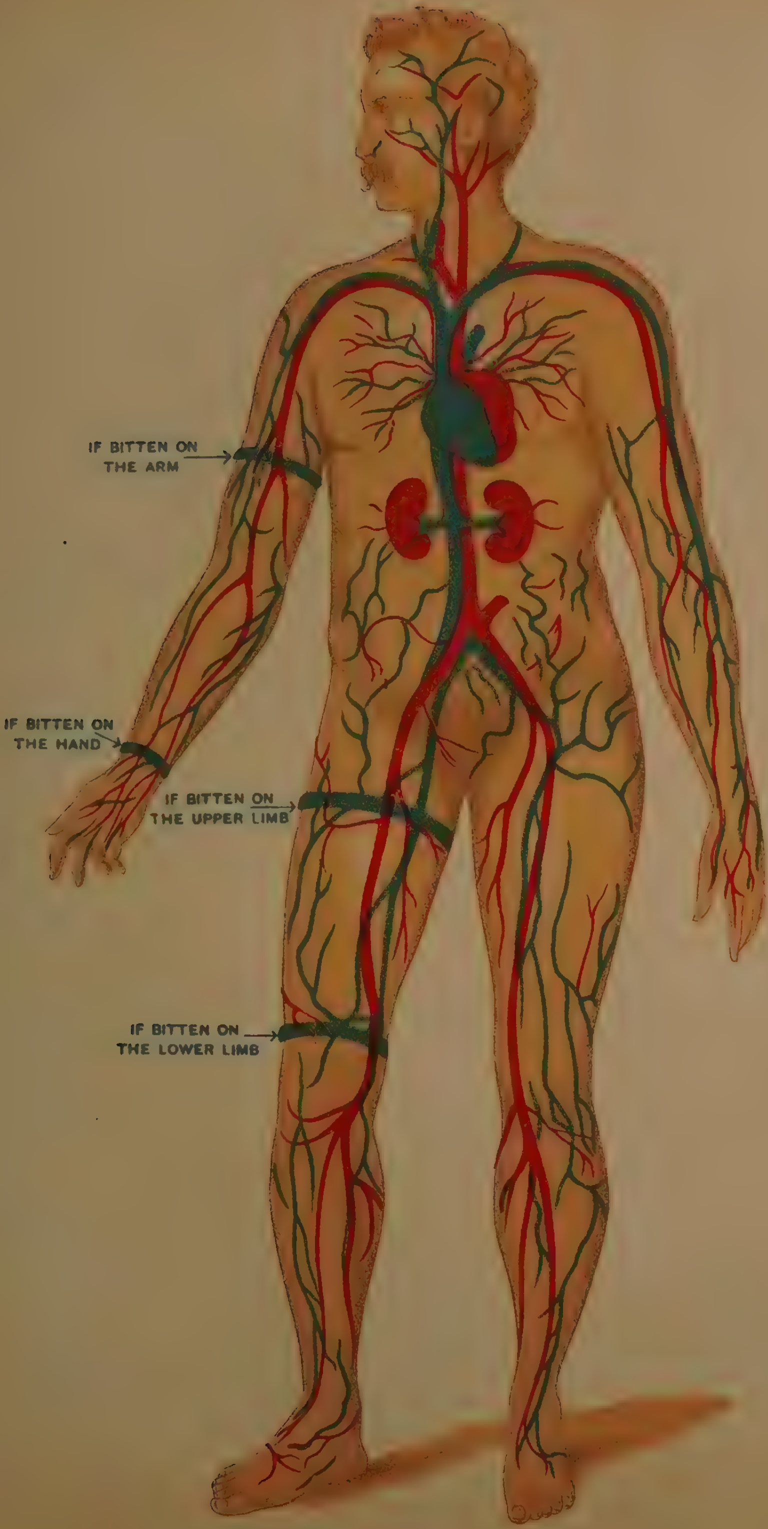
2. If the bite be on the hand, bind the cord tightly around the wrist at the point indicated by the head of the "*hand*" arrow.

3. If the bite be on the upper part of the leg, bind the cord tightly around the limb at the point indicated by the head of the "*upper limb*" arrow.

4. If the bite be below the knee, bind the cord tightly around the limb at the point indicated by the head of the "*lower limb*" arrow.

5. **Further Precautions.**—It is perhaps unnecessary to add that in the emergency of a mad dog bite the band for preventing the virus from entering the system should be applied as quickly and tightly as possible. If the material is at hand, several of such bands, tied one above the other, will prove more effective than a single one. An additional emergency measure, and a very proper one, is to quickly cut the wound out with a sharp knife, and then to cauterize it with a hot iron, or such other means as may prove to be at hand. Make all haste to get the victim within reach of the remedies given in the pages above mentioned.

The Snake Bite.—The snake bites that are dangerously poisonous are those of the copperhead, water-moccasin, rattlesnake and viper. As in the case of the mad dog bite, several bands, tied one above the other, are better than one. The wound should be cut out, and then sucked. No harm can come from this if the mouth be free from sores, or the poison is not swallowed. In the absence of other means of cauterizing a snake bite wound, hunters pour powder upon it and explode it with a spark. The band or bands used should not be removed for some time, and in case of more than one, the uppermost one should be removed first.



ACCIDENTS AND EMERGENCIES. WHAT TO DO IF BITTEN BY A MAD DOG

above the bleeding point. On loosening this, slight pressure upon the wound and elevation of the foot above the level of the hip suffice to arrest the bleeding.

Control of Hemorrhage by Compression.—If, however, bright, red blood continues to flow, in spite of pressure over the wound, a large artery must have been injured, and speedy death from loss of blood must be apprehended. In such instances, prompt aid is necessary, and a physician or surgeon should at once be sent for.

Where to Place Pressure.—Until he arrives any intelligent person can probably succeed in checking the flow of blood by making very firm pressure on the wound itself, if it is small, or on the trunk of the artery above the wound. The injured limb should be raised, as this lessens the force of the pulse in it, and, of course, the violence of the flow of blood. After cutting the clothing away from the source of hemorrhage, a folded piece of clean linen, or a pocket-handkerchief, should be laid on the wound, and fastened firmly down by means of a bandage or another handkerchief. But if, in spite of this, the blood still continues to run, the trunk of the artery between the heart and the wound must be sought for and firmly compressed by the fingers, the handle of a large key, or some other suitable object. In certain parts of the body the arteries lie so near the surface that they can be effectually compressed with the fingers.

Pressure on Arm Artery.—In the upper part of the arm the main artery courses along the inner side, nearly in a line with the inner seam of the coat or dress sleeve, as is shown in the accompanying figure. By feeling along the place indicated by the dotted line, it is easy in any spare person to discover the strong pulsation of this large artery of the arm, or brachial artery, as it is technically called. The artery may be compressed in this position by placing a thick stick between the arm and the chest, and tying the arm tightly to the body, or by pressing the artery firmly against the bone of the arm with the thumb, as shown in the illustration.

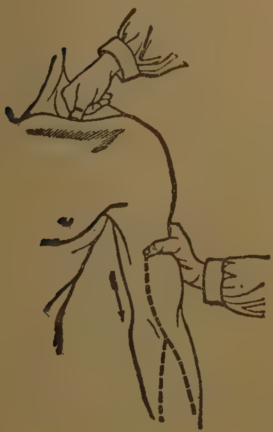


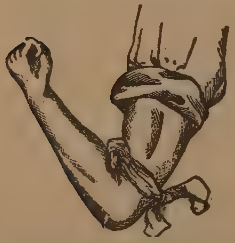
Diagram of Main Artery of the Arm.

Pressure at Collar Bone.—Sometimes, when the wound is higher up on the arm, or in the arm-pit itself, it may be necessary to compress the artery at a point nearer the heart; and this can usually be accomplished by making pressure with the thumb or a big key, just behind the collarbone, as is also indicated.

The Spanish Windlass.—If it is found difficult to continue the application of force in these situations, or if the only person present must leave the sufferer whilst he hurries off for assistance, the little device known by the name of the Spanish windlass should be resorted to. To apply this, take a large handkerchief and fold in it a rounded pebble about an inch in diameter, or any other smooth, hard body of similar size; fold the handkerchief cravat-shape, and tie it loosely about the limb, at the point where pressure is to be made upon the artery; and then, putting a stout stick beneath the loop, twist it around so as to tighten the handkerchief and bring a strong pressure upon the stone underneath the loop on the side opposite to the stick, which in its turn compresses the artery and stops the flow of blood. This is, of course, a much more painful, as it is a more powerful method than pressure by a bystander's thumb or finger; but in urgent cases it may be needful to call it into service in order to save life.

The Tourniquet.—The Spanish windlass is a rough imitation of the surgical instrument called a tourniquet, which is far preferable as a means of arresting hemorrhage whenever it can be procured. As soon as a tourniquet can be obtained, it should be substituted for the primitive and painful windlass, which, if continued several hours upon a limb, might itself lead to mortification of the part, and perhaps to a fatal result.

Treatment With a Handkerchief.—In order to check bleeding from wounds in the arm below the elbow, or about the hand, where workmen of all kinds are particularly apt to receive injuries, take a large handkerchief, as before, and tie up in it a stone or a potato of the size of a walnut, or a simple, large, hard knot will perhaps answer the purpose. Then fasten it loosely about the arm, just above the elbow, as shown in the illustration, and bend up the forearm so as to make the knot press upon the large artery in its position in the hollow of the elbow, as indicated in the accompanying wood-cut. If the hemorrhage is found to be checked, the knot is in the right place at the bend of the elbow; but if blood continues to flow, straighten the arm, move the knot or stone a little, and try it again. As soon as you find the flow of the blood is stopped, take another large handkerchief, or a strip of bandage, and fasten the wrist firmly to the shoulder, so as to keep up the life-saving pressure upon the blood-vessel at the elbow.



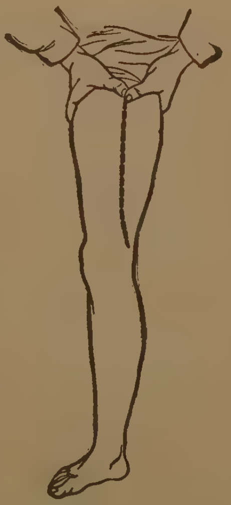
Method of Checking Hemorrhage in the Hand or Wrist.

Wounds Below the Knee.—Hemorrhage from wounds of the leg, below the knee, or of the foot, such as are so often inflicted by the slipping of an axe or hatchet in chopping wood, may be controlled in a very similar way by tying a large pebble in a handkerchief, so as to make a knot the size of a turkey's egg, fitting it in the hollow of the knee, and then bending the leg up on the thigh in such a manner as to produce pressure upon the artery, on exactly the same principle as that displayed in the figure just above. When it is found that the knot is properly adjusted, so as to answer the purpose of arresting the flow of blood, the leg should be secured in its doubled-up position in order to prevent a return of the hemorrhage, in consequence of the apparatus becoming displaced.

Thigh Wounds.—For bleeding from wounds in the thigh, the artery must be compressed an inch or two below the middle of the groin, and about as far in front of the usual position of the inner seam of the pantaloons. The exact point is indicated by the marginal illustration, which shows very well the way in which the thumbs ought to be applied.

Pressure on Thigh Artery.—The femoral artery, or artery of the thigh, is so large and strong that its pulsation can usually be felt without much difficulty in thin or even moderately spare persons; and it is a good plan for every one to become acquainted, by examining his own body, with the location of this and the other chief arteries. This point in the femoral artery is also a favorable one for making compression in bleeding wounds of the foot and leg.

Fainting Fit.—In whichever way bleeding from an important artery has been for the time checked, it must be remembered that it is very liable to burst out again the moment the pressure is relapsed or the obstruction removed; also, that when a person faints from loss of blood the hemorrhage ceases whilst the heart is beating feebly in the fainting condition, and the blood may clot quite firmly in the mouths of the divided blood-vessels. When, however, the patient revives the renewed vigor of pulsation in the heart and arteries will generally drive out these recently-formed clots of blood, and the bleeding starts afresh with, perhaps, a speedily fatal result, if a most vigilant watch is not maintained over the wound. Where the hem-



Course of the Femoral Artery.

orrhage is venous only, however, there is a good prospect that the clots of blood formed in the open mouths of the vessels will be able to resist the feebler pressure brought to bear upon them by the reviving circulation, and that bleeding will be effectually checked by the occurrence of the fainting fit.

Tying of Blood-Vessels.—In order to obtain primary union, it is necessary, in dressing a wound, to stop all hemorrhage. A surgeon grasps with forceps the end of any vessel that bleeds considerably, and before closing the wound ligates or ties it. Sterilized catgut is best for ligatures, but silk, or even cotton thread that has been boiled, will answer. Simple twisting with forceps will arrest hemorrhage of very small vessels, while oozing is generally controlled by pressure with compresses wrung out of water as hot as can be borne by the hand.

Reaction from Shock.—See Shock.

Cleansing of the Wound.—This includes the removal of both foreign matter visible to the eye, and the removal as well of microscopic germs which contaminate every accidental wound. Have at hand plenty of water and good soap. Scrub the wound and surrounding area thoroughly with soap, with scissors and forceps removing any visible foreign matter (splinters, bits of clothing, grains of dust or hopelessly damaged tissue). Wash with plain water and alcohol and irrigate with corrosive sublimate solution (1 to 1000). If the wound is of a hairy part, the area should be shaved. All blood clots should be removed and the wound left clean and dry.

Provision for Drainage.—Most accidental wounds, unless small and superficial, should be left partially open for drainage, so that infective material which it has not been possible to remove, may flow out. In such cases, a bit of rubber tubing may extend to the depth of the wound or a strip of iodoform gauze or plain sterile gauze may be gently inserted to the depth of the wound, one end of the strip protruding. A few strands of suture material well serves the purpose.

Closing of the Wound.—Where confidence of thorough disinfection is felt, and the loss of tissue is not too great, the edges of the wound should be brought together and the tissues held in the relation they bore before injury. Sewing or suturing a wound is the best means to this end. Surgeons use special needles and a variety of suture materials, silk, silver, wire, silk-worm gut and specially prepared catgut. In an emergency, however, a large sewing needle and large-sized cotton sewing thread, which have been boiled, may do good service. Interrupted stitches (each stitch tied separately) are usually the better. The edges of a superficial wound may be held together by strips of adhesive plaster placed outside of the dressing of the wound. Or, in slight cuts and abrasions, collodion painted over a bit of dressing is sometimes efficient.

Dressing of the Wound.—Any aseptic or antiseptic material which absorbs wound discharges freely, such as absorbent cotton, cheese-cloth or even thin old muslin forms a good dressing. Sprinkling the wound freely with an antiseptic powder helps to prevent suppuration; dressings had better be applied moist, wrung out of bichloride of mercury solution (1 to 2000). Plentiful dressings should be applied, sufficient to soak up the wound discharges and to protect from outside infection. A wound should be disturbed for dressing as seldom as possible. If the dressings become soaked with wound fluid, if there is much pain, or a rise of temperature indicates suppuration, the wound should be freshly dressed; otherwise, the dressing should remain in place a week or ten days.

Securing Rest.—In case of severe wounds, not only should the patient rest in bed but absolute rest to the part should be secured. Compression by firm bandage, an easy relaxed position, fixation by splint or plaster dressing, support of the arm in a sling, these all give comfort and hasten healing of a wound.

Constitutional Treatment.—General treatment should be according to the suggestions for the treatment of inflammation; in addition, watch for suppuration, gangrene, erysipelas or tetanus. Temperature is a good index of the condition.

Punctured Wounds.—Wounds made by sharp instruments (such as a dagger, a splinter, a fork prong, and so forth) have especial dangers, and require radical treatment. Foreign bodies are frequently left at the depth of such a narrow wound; the opening is small and readily closes, locking up infective material; underlying organs of the abdomen, head or chest are liable to injury. Such wounds generally demand the attention of the skilled surgeon. He will usually probe for a foreign body and will generally open the wound to its depth, often incising it freely, in order to disinfect it properly and to allow for drainage. He will determine whether underlying organs are injured and any treatment needed for such.

Gun-shot Wounds.—The special dangers to be combated in gun-shot wounds are shock, hemorrhage and infection. Injury of vital organs is liable. In many cases it is better not to probe for a bullet. The ball should be searched for when it has surely carried in with it foreign bodies; when it is in a vital organ, as the brain; and when its presence interferes with healing.

Poisoned Wounds.—Dissection wound is a term applied not only to wounds received by medical students and surgeons in their dissections, but to wounds sometimes received by butchers, cooks and fish-dealers, who handle putrefying animal matter. Such wounds are particularly virulent. A wound of this character should be thoroughly washed, and the blood squeezed out of it. If a puncture, it should be freely opened and swabbed with pure carbolic acid, then washed with bichloride of mercury solution, and wet antiseptic dressing applied. Bites by animals should be so treated, the human bite being one of the worst.

Stings and Bites of Insects.—For the more common and less poisonous wounds, applications of solutions of washing or cooking sode, ammonia water, iodine or lead-water and laudanum, give relief. The bite of a large spider or scorpion should be treated as a snake bite.

Snake Bites.—Copperheads, water-moccasins, rattlesnakes and vipers are the only poisonous snakes of the United States. We have a poisonous lizard known as the "Gila monster." A snake bite must be treated promptly and usually without proper appliances. When the bite is upon a limb, very tightly tie or twist a band or fillet around the extremity above the wound; several such bands are better. Cut out the wound at once, suck the wound, burn it with nitric or carbolic acid or heat. A hot iron is efficient; hunters may pour powder into the wound and apply a spark or lay a live coal upon it. Constitutionally stimulate freely with whiskey or brandy to sustain the system while it is ridding itself of the poison. Strychnine, ether and digitalis hypodermically are valuable. The fillets should not be removed for some time, and then slowly, one at a time, the uppermost one first.

Hydrophobia or Rabies.—This is an infectious disease due to inoculation through a wound with the virus from a rabid animal. The animal may be a dog, a cat, a wolf, a fox or a horse. About 14 per cent. of the people bitten by mad animals develop the disease and die.

Treatment of Hydrophobia.—When a person is bitten by a supposed rabid animal and is seen soon after the injury, firm constriction of the part above the wound should be made, the wounded area should be freely cut out, burned with a hot iron or nitric acid and dressed with wet antiseptic dressing. If the patient is not seen within a few hours of the injury, cauterization will do no good. In any case, send the patient to a Pasteur Institute for preventive treatment. If the animal causing the wound was not rabid, treatment will do no harm; if it was mad, treatment will probably save the patient.

FIRST CARE OF A WOUNDED PERSON.

Careful Handling.—In moving a wounded person from the scene of accident, the chances of recovery are often very much increased by adopting the method involving the least amount of additional injury to parts which have already suffered. The dangers to life from a broken leg, for example, when the skin is not cut through, are more than doubled, if, by ignorant handling, with the kindest intentions in the world, the affected limb is allowed to swing downward for a single instant so that some sharp splinter of bone penetrates the skin, and makes the injury a compound fracture.

An Improvised Stretcher.—The best method of moving a person who is unable to walk, is upon a stretcher or litter, which may be a light lounge or bedstead, an old-fashioned settee, a long bench, a door or window-shutter slipped off its hinges, or a simple, broad board. Such hard materials should be covered with blankets, quilts or the coats, and so forth, of bystanders. In the woods, two poles about ten feet long, kept apart by forked sticks about a foot in length, tied in place with rope, twine or leather straps, or even some climbing plant, and covered with clothing, form a very good litter.

Loading the Stretcher.—To place the helpless patent upon such a vehicle of transportation, the litter should be set down with its foot at the head of the patient as he lies upon the ground, and in a line with his body. Then, if there is plenty of assistance at hand, let the acting surgeon of the party take charge of the wounded limb, and devote himself, after giving the necessary instructions to an acting assistant surgeon chosen on the instant, to protecting that injured member in every way. Next, let four persons, under direction of the assistant surgeon, lift the sufferer by his hips and shoulders, two others supporting the head and feet, as may be necessary, and when raised to a sufficient height, let two others, still, slide the prepared litter under the patient as he is held up in the air by his seven bearers. He can then be gently deposited upon the litter, having undergone the least amount of disturbance possible under the circumstances.

When Only Two Persons are Present.—When but few persons are present, this plan of procedure, must, of course, be modified; and if the services of only two people are available, it is better, usually, for them to lift the wounded man together, both standing on the same side, one at the shoulders and the other near the hips, and tenderly lay him upon the litter, which has been placed at the opposite side.

Other Ways of Handling Wounded.—Another mode, which answers very well when the lower limbs are not injured, is for the two bearers to stand on opposite sides of the patient, and, clasping each others hands beneath his hips and shoulders, carry him a few steps to the litter, which has been arranged with its foot to his head, as directed above, in the first instance. If alone with an individual so severely wounded as to be helpless, the best way often is to make him as comfortable as possible, see that there is no danger of serious bleeding, leave him some weapon with which to defend himself, and hasten for the nearest assistance which can be procured.

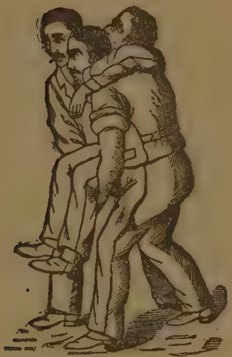
Carrying the Litter.—The litter should be carried by two persons, whilst the acting surgeon walks by the side and keeps a constant watch over the patient. The following rules should be observed: First, the litter should be carried with the hands, or supported by straps passing over the bearers' shoulders. The litter itself should never be placed upon the shoulders of the bearers, because the patient might then fall off, or even die from hemorrhage or other cause without his danger being observed.

Bearers Not to Keep Step.—Second, the bearers should not keep step. If they keep pace, as in marching, the litter shakes from side to side, and the patient is apt to roll about, or even to be thrown to the ground. To prevent this, the bearers must walk in broken step—that is, not putting the rightt foot, for example, forward at the same moment—and then the litter remains nearly even as it is borne along.

Pace of the Bearers.—Third, the pace of the bearers should be short, not more than twenty inches, and the steps made without any spring on lifting the foot from the ground. All jolting, all hurried movements and lifting over fences, ditches, and so forth, are to be avoided. Send some one ahead, if practicable, to look out for gates, bridges, and similar advantages, which are very important in the transportation of the sick and wounded, and let him come back and guide the bearers in the easiest path to the place of destination.

Bearers of Same Height.—Fourth, if it can be done, choose bearers of the same height, and should it be impracticable to do this, arrange the shoulder-straps in such a way that the litter will hang as level as possible. Fifth, in ascending an inclination, such as hill or staircase, the patient's head must be in front, and in descending it should be behind. If, however, the invalid has a broken leg, this rule must be reversed; otherwise the weight of the body would press upon the injured part, and, perhaps, aggravate the trouble. Sixth, the patient should usually be removed from the litter in the same manner as he was placed upon it.

In Absence of a Litter.—Should neither a litter nor material out of which one can be made present itself on careful search, the wounded man must be supported in the arms, which of course can only be done as a general thing for short distances. If there is only one person at hand to help, and if the injured man can walk, though weak and faint from loss of blood, he must put one arm around the neck of the individual aiding him so that his hand hangs down over the further shoulder. The person assisting places his arm from behind around the waist of the wounded man, and with his other hand grasps that of the patient as it hangs over his shoulder. In this mode he can support him very efficiently, and if necessary even raise him from the ground for a few steps over difficult places, and so help him along. Should the patient, however, be unable to walk, the only resource is for the person helping him either to take him on his back, or, if not too heavy, to carry him in his arms like a child. In either case the wounded person should clasp his arms around the neck of the bearer.



Method of Transporting a Wounded Person.

Joining Hands for a Seat.—Should there be two people at hand to render assistance, one of the best modes is for the bearers to join hands so as to form a seat, in what is popularly called among children "Lady of London fashion," and placing the patient upon this, as shown in the above picture, he may be transported for long distances with considerable ease. Should the patient be unconscious it will be necessary for one of the bearers to support the upper part of the body by walking behind him with his hands clasped upon the patient's chest, after they have been passed beneath the sick man's arms. The other bearer walking in front carries the legs of the sufferer, one under each arm.

Bed for Accident Patient.—The preparation of the bed for a patient who is the subject of a severe accident is a matter of no little importance. The couch intended for the reception of an accident case, wounded about the legs or hips, should be provided with a large sheet of water-proof material and an extra sheet folded and placed across the bed, so that it can be readily removed when soiled with blood or other discharges without disturbing the head and shoulders of the patient. If the mattress is likely to yield to any extent with the weight placed upon it, it should be supported with extra slats. In case of wounds about the head, the pillow ought to be protected by a piece of extra sheeting.

Undressing the Patient.—A patient who is not too much injured to endure the effort should always be undressed before being placed in the bed. All tight clothing about the neck should at once be loosened or altogether removed. Boots must be taken off with great care.

Case of Broken Leg.—If the leg is broken it is better to cut the boot down the side and nearly to the toe. Pantaloons need not be cut, unless the patient's leg or thigh is injured, in which case the outside seam ought to be ripped up, so as to get them off without causing suffering to the invalid. In taking off the coat and waistcoat always remove them from the sound side first, and then they come away from that which is injured with comparatively little difficulty.

Unloading the Litter.—When a patient who is unable to walk is brought in on a litter or stretcher of any kind, such as a window-shutter or door, the litter should be placed with its head at the foot of the bed which the invalid is to occupy, and lying in the same direction, this position being the most convenient one for transferring the sick man to his couch. To properly lift an adult patient four assistants are required, two standing on either side. One of these helpers should support the head and shoulders, and a second the hips on one side, whilst on the other side the third assistant lifts the back, and the fourth supports the legs. In some cases the size or arrangement of the room will not permit this.

Placing the Patient Abed.—The litter must then be laid alongside of the bed, and three assistants lifting the patient into the air, a fourth rapidly withdraws the litter to allow the bearers to approach the side of the bed and deposit the invalid upon it. All the assistants should commence to lift together, and set down the patient at a given signal, special attention being devoted to the injured limb. The bed-clothes should be folded back for the whole length of the bed on one side, leaving one-half of the bed laterally uncovered for the reception of the patient. By this little maneuver they are easily replaced over a frame of wire, or of two half hoops tied together in their centres, in such a way as to protect the wounded limb from the weight of the bed covering.

INFLAMMATION.

Definition.—Inflammation is defined as "the changes which occur in living tissue when it is injured, provided that the injury is not of such a degree as at once to destroy its life." Inflammation may end in return of the tissues to complete or partial health, or in their death. Death of inflamed tissue may occur by suppuration, ulceration or gangrene.

Causes of Inflammation.—The causes of inflammation are predisposing and exciting. Predisposing causes are such as are present in the tissues and render them liable to inflame; any affection or indulgence which impairs the health or weakens the system is a strong predisposing cause. Exciting causes are injuries, for example, blows, falls, crushes, burns, and so forth.

Symptoms of Acute Inflammation.—Symptoms are general or constitutional and local. The former are manifested chiefly as fever. The latter in an organ or a part, as heat, swelling, pain, discoloration and disordered action or function. Constitutional symptoms of acute inflammation may be absent, but in severe cases they are sure to occur, forming the symptom group known as fever—symptomatic or inflammatory fever.

Chronic Inflammation.—This condition is gradual in onset and progress. There are no constitutional symptoms due directly to the inflammation. As to local symptoms, there is pain, varying in degree and character; swelling is often great; function is more or less interfered with; heat and discoloration are rare.

Treatment of Acute Inflammation.—The prime rule of treatment is, first to remove the exciting cause. If it be a splinter, pull it out; if drink or indigestible food is inflaming the stomach, stop it; scrape out diseased bone, clean out the germs from an infected wound. Further treatment should be both local and constitutional.

Local Treatment of Inflammation.—Two agents are suited to the treatment of both the early and the late stages of an inflammation, namely, elevation and rest. Elevation combats engorgement of the part. A sprained ankle is more comfortable if put on a level equal with or higher than the body. Rest is of utmost importance. Rest of the patient in bed should be insisted upon in every severe inflammation. Rest to an inflamed part is secured by various means. The partial, or better, the complete cessation of the usual action or function of an organ, is desirable. To an inflamed eye, rest is secured by dark glasses, a darkened room, or a pad to exclude the light; to a sprained joint, by an easy position and fixing it on a splint, or hanging the arm in a sling.

Other Treatments.—In the early stage of an inflammation, when the vessels are engorged, local bleeding and cold are valuable agents. Local blood-letting is done by cutting, leeching or cupping. Neither of these should be done except under the intelligent guidance of a physician.

Cold is highly valuable if used wisely; it is not to be used after the early stages, not to be too long continued or too intense; it should usually not be used with the very aged or very feeble.

Wet cold or dry cold may be employed. Wet cold is obtained by various fluids; ice water or water mixed with one-fourth the quantity of alcohol is good. One of the most common and best applications is lead water and laudanum. It is composed of one ounce of laudanum, one or two ounces of Goulard's extract, and one part of water. A few layers of muslin or cheese-cloth should be kept upon the part and should be frequently wet with the fluid.

Dry cold is generally safer, more easily applied, more comfortable. Cracked ice is put into a rubber ice-bag or bladder, or wrapped in a piece of flannel, and so applied, several folds of flannel first being placed over the part. The immediate application of an ice-bag to a sprained joint is excellent treatment. In all applications of cold the part must be carefully watched to guard against too great interference with the circulation.

Treatment in Later Stages.—Treatment in the later stages of an inflammation is directed toward promoting a reabsorption of the material which has been poured out, a clearing up of the wreckage. This is accomplished by compression, the application of astringents and sorbefacients, massage and heat.

Compression.—Compression is usually obtained by the firm application of a bandage. It should never be forcible, and if applied to a limb, should always include the distal extremity, *e. g.*, the elbow or wrist should not be firmly bandaged without including the hand and all the part below the affected area.

Astringents and Sorbefacients.—Lead water and laudanum, before mentioned, has an astringent effect. Tincture of iodine diluted with from one to three parts of alcohol, painted from time to time over an inflamed area, is often useful. Ichthyol ointment is very excellent in inflammatory swellings. It is rubbed well into the part or applied upon a cloth. It is best prepared by mixing one part of ichthyol with one to three parts of lanolin. Mercurial or blue ointment is used in much the same way as is ichthyol ointment.

Massage.—Massage is a systematic rubbing and manipulation after the acute symptoms have subsided. Motion and massage prevent stiffness, promote circulation and absorption, and bring tone and health to a part.

Heat.—Heat, either moist or dry, may do good and should generally be substituted for cold after a day or two. It then commonly gives greater comfort, relieving pain. Heat may be applied by fomentations, poultices, water bath or douche, and dry heat.

Fomentation.—Fomentation is the application to the skin of a piece of flannel wrung out of a hot liquid, usually water, as hot as can be borne. It is covered by a rubber-dam, oiled silk, or waxed paper; cotton should be placed outside the latter and the whole held in place by a bandage. A hot water bag placed over the bandage is useful.

Stupes.—The turpentine stupe is made as above by sprinkling upon the wet flannel from ten to twenty drops of turpentine.

Poultices.—A poultice is a soft mass applied to a part to bring heat and moisture to bear upon it. Poultices may be of flaxseed, arrowroot, starch, bread and milk, and so forth. A poultice should be applied in thickness of half an inch, should be covered with rubber-dam, waxed paper or oiled silk and overlaid by a hot water bag. It should be removed before it cools, another being ready to apply at once. Where suppuration is threatened or exists time is often wasted and suffering prolonged by continued poulticing. This great blunder is common with the laity. In such a case, free opening by incision cannot be done too quickly.

Dry Heat.—Dry heat can be easily applied with the hot water bag, a bag of hot sand or meal, a hot plate or bottle.

Counter-Irritation.—By counter-irritation we mean the use of some irritant upon a surface, thus attracting an increased quantity of blood and relieving thereby inflammation of a deeper structure. Blisters, mustard plasters, turpentine stupes, tincture of iodine, liniments, and so forth, are so used.

Constitutional Treatment.—General treatment may include general bleeding, circulatory sedatives, diaphoretics, diuretics, anodynes, antipyretics, stimulants and tonics. Hygienic measures are invariably demanded, cathartics are usually indicated.

Cathartics.—One of the first essentials in beginning inflammation, is free movement of the bowels. If this has not occurred spontaneously, one of several purgatives may be given. Calomel is often invaluable. It may be given in doses of one-tenth to one-fourth of a grain, repeated every hour until a grain or more is taken, or be given in one large dose of one to three grains. It may have to be followed by castor oil or epsom or rochelle salt. Either of the latter is sometimes excellent alone, a teaspoonful of each or of both being given every hour until a movement occurs. A bowel injection or enema composed of glycerine one ounce, epsom salt one ounce, and enough soapsuds to make a pint is often helpful.

Hygienic Measures.—These are of the utmost importance. Diet should be nutritious and easily digested. Milk is the ideal food. If peptonized it is more readily digested. Fermented milk known as koumiss, is excellent. Meat juice is highly nutritious. Meat broths are stimulating but do not contain a large quantity of nutriment. Soups strained and skimmed may be borne. As a patient grows better, he may take soft eggs, custard, junket, rice pudding, milk toast, boiled chops, oysters, and so forth.

The Sick Room.—The sick room should be bright and well ventilated. The temperature 68 degrees Fahrenheit. Bed clothing should be clean, the patient should be sponged daily for cleanliness and to keep the skin active. A little alcohol added to the water makes a grateful sponge bath.

Antipyretics.—Antipyretics are agents reducing temperature. If fever is excessive, it is best lowered by cooling drinks and the application of cold to the surface. The latter is most usually accomplished by ice-bags, by cold sponging or cold pack.

Stimulants.—In low, long-continued inflammatory fever, some form of alcohol is most essential. It should, however, be given under the direction of a physician only.

ABSCESSES, BOILS.

Abscess.—An abscess is a newly formed circumscribed cavity containing pus. This new cavity is formed by the liquefying action of the bacteria upon the tissues.

Forms of Abscesses.—The general classes of abscesses are acute, following an inflammation, and that variously called chronic, cold, strumous or tubercular. The latter form is due to the bacillus of tuberculosis, and does not contain true pus.

Acute Abscess.—As soon as it is determined that an inflammation has gone to suppuration, free opening should be made. After free opening and evacuation, an abscess cavity should usually be irrigated by an antiseptic fluid. If free opening has been made, hydrogen peroxide is excellent for cleansing. This should be followed (unless abscess be of an internal organ) by corrosive sublimate solution (1 to 1,000 or 2,000). Drainage by tube or otherwise should be provided and hot moist antiseptic dressings applied. Rest promotes healing. This is obtained by bandages, splints, slings, and so forth.

Chronic Abscess.—The tubercular cold, scrofulous, or so-called chronic abscess, is a cavity produced by the action of the bacilli of tubercle. No true pus is present unless pus organisms have also gained entrance. A cold abscess lacks inflammatory signs. There may be no constitutional symptom unless true suppuration is added. The general health of the patient is, however, invariably below normal.

Treatment of cold abscesses is upon the general principles for the treatment of acute abscess, but should be trusted to none but a surgeon.

Felon or Whitlow.—This is a violent rapidly-spreading inflammation of a finger or toe, usually the former, due to pus germs. The symptoms are throbbing pain, great tenderness, swelling, a dusky redness. In case of a deep felon redness and pain may extend up the arm, and there is usually fever.

Treatment.—Rarely the application of iodine, cold, rest and elevation may afford relief. Generally, however, such treatment is worse than useless. Early free incision is very generally the only effective procedure. Incision, irrigation, antiseptic fomentations, and splinting, with elevation of the extremity, is the outline of treatment.

Boiles or Furuncles.—This is the most common form of superficial abscess. If not surgically treated, a boil will finally rupture, pus will flow out, and a "core" of dead tissue at last be discharged. The treatment consists of early crucial incision, removal of dead tissue, irrigation with peroxide of hydrogen and corrosive sublimate, and the application of hot antiseptic fomentations.

Carbuncle.—This condition is a circumscribed infectious inflammation of the deeper layers of the true skin and subcutaneous tissues. It ends in a slough. A carbuncle has many points of suppuration. It often causes profound constitutional disturbance, and may prove fatal in the aged and enfeebled.

Treatment.—The best treatment is that of cutting out, under general anesthesia, the entire area infected. The large wound produced heals by granulation, or may later be skin-grafted. The wound is treated and dressed antiseptically. Secure rest and sleep with morphine, give nourishing diet and attend to the bowels and kidneys.

Ulcers.—An ulcer is a loss of substance (due to inflammation) of a superficial structure. It is commonly known as a "sore." The causes are various. Blows may knock off the skin. Burns may cause extensive ulceration. General diseases, such as tuberculosis or syphilis, may predispose to ulcers. Bed sores are common. Varicose ulcers of the leg, due to enlarged veins, are frequently met with.

Treatment.—Treatment consists essentially of removing the cause, so far as possible, and in treating the ulcer antiseptically. If a bed sore, remove the pressure; if syphilitic, internal medication is imperative; if a varicose ulcer of the leg, daily antiseptic cleansing should be practiced, and aseptic dressing should be applied. The most important factors, however, in assisting nature to relieve the engorged veins are rest, elevation, and firm, smooth bandage from the toes extending above the diseased area.

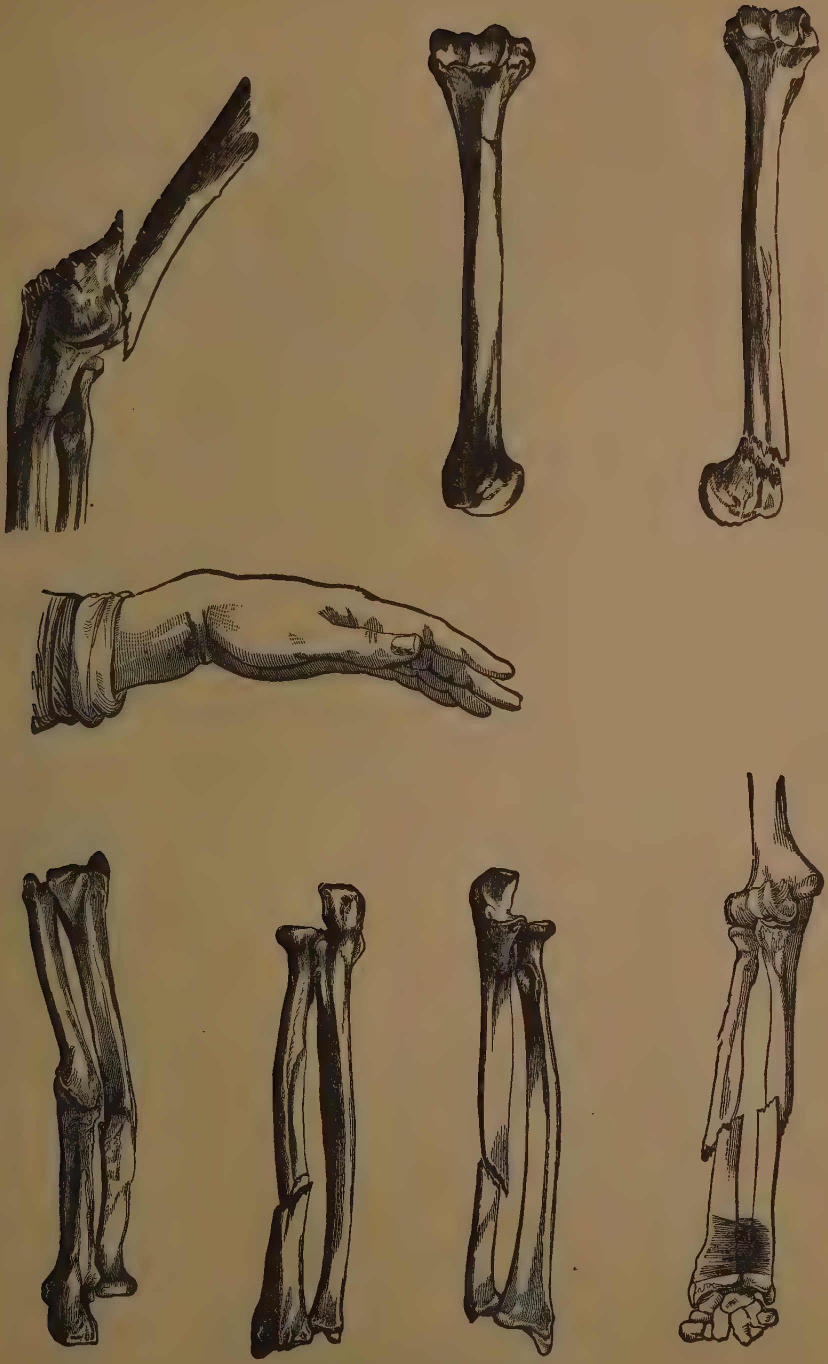
Gangrene or Mortification.—These denote the death of a part of the living body in mass. Putrefaction of the part occurs while it is attached to the living body. Gangrene results from a cessation of blood supply, or from obstruction of the outflow of blood from a part. Common among the causes producing such interference are a feeble heart and hard diseased blood vessels. Other causes are injuries, such as a crush, heat or cold, constitutional disease, such as diabetes.

The aged and enfeebled with hard vessels, should avoid injuries, even slight ones, of the feet. The mere cutting of a corn too closely may lead to gangrene. Such a person should attend carefully to the general health and should especially keep the feet warm and comfortable. The treatment of gangrene demands all the skill of a competent physician.

FRACTURED OR BROKEN BONES.

Kinds of Fracture.—Fractures are classified as of two kinds, the simple and the compound. A simple fracture is one in which the skin is not injured, so that no matter how much the bone is broken up, there is no communication of the fragments with the external air. A compound fracture is one in which the breaking of the bone is accompanied by a wound, caused either by the same force which produced the break, as, for instance, a bullet, or by the ends of the broken bones protruding through the skin. For example, a man may fall from a tree, breaking the femur or large bone of his thigh, and the broken end of the bone may be driven through the skin and into the ground. Compound fractures are much more dangerous than simple ones, chiefly because whenever the skin is broken there gain entrance to the tissues disease-producing germs, which set up the process of suppuration.

Treatment.—Compound fractures are also more likely to be serious because the skin and muscles are much bruised. When, however, the wound which communicates with the fracture and makes it compound is small, an effort should be made to gain the advantages of a simple fracture by covering the opening in the skin with a clean cloth wrung out of corrosive sublimate solution (1 to 2,000) or wet with salt solution (one teaspoonful to the pint) until the surgeon arrives and takes charge of the



BONE FRACTURES

case. This imperfect effort at antiseptic treatment must often fail, from the impossibility of applying it quickly enough, but it ought always to be tried.

Recognizing Fractures.—We may recognize the fact that a bone is broken by the following indications: first, that the limb is shortened or bent where there is no joint; second, by there being an unnatural degree of movement at the seat of injury; third, by the violent pain which attends a fracture; fourth, by the grating which may be felt, and sometimes even heard, when the limb is moved.

Setting of Broken Bones.—This consists merely in pulling and pressing the fractured extremities of the bone into their proper position. Such an operation, of course, requires a full knowledge of the anatomy of the parts and should, as a rule, be left for a skillful medical attendant, if he can be procured, within twelve hours. In the mean time the wounded part should be placed in the most comfortable, or rather the least painful, posture, wrapped in cloths wet with laudanum, or lead-water and laudanum, and kept cold with ice, in order to prevent swelling and diminish the suffering as far as possible.

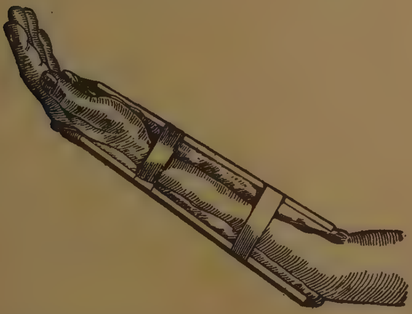
Keeping a Broken Bone in Place.—When the physician succeeds in replacing the fragments, his next object is to secure them from being again deranged. This is usually accomplished by the aid of splints of various kinds, such as are shown applied to the arm on the opposite page. These splints may be made of wood, tin, pasteboard, or gutta percha, and are kept in place themselves by bandages or knotted handkerchiefs. In certain cases, material, such as plaster of Paris or starch, which stiffens after it is applied to the limb, upon a bandage, can be employed with great advantage.

Injuries Far from Home.—When a person is injured far from any habitation, and must be moved a considerable distance, if it is found that a bone has been broken, the first thing to do is to apply to the fractured limb a temporary splint. This will prevent the injury from becoming compound, if it is as yet only a simple fracture, and will save the wound from being irritated, if the injury is already a compound one.

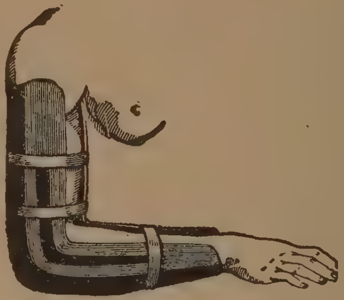
Bandaging.—For the making of bandages and the various kinds see conclusion of this article. The operation of bandaging requires some practical experience before it can be performed neatly. The idea, however, of the method of procedure, winding the cloth smoothly around the arm, for instance in a spiral direction, can be gathered from the illustration. Where the limb is conical, increasing in size from below upward, the only way to cause the bandage to lie evenly and be of much use is to make what are technically called reverses, turning the roll of linen over each time as it comes on top, as is represented in the wood cut. The artist, however, has delineated the surgeon's fingers as being those of a left-handed man, a variety of the human species which, strange to say, is tenfold more numerous in pictures than in real life. The best substitutes for bandages available at a distance from human habitations are often to be found in handkerchiefs.

Application of a Bandage.

Splints.—To obtain splints for the temporary support of fractures, the most varied articles have been pressed into service. Thin, light boards, like shingles or the sides of a cigar-box, which can be cut into any form desired, are often the best, but any object which may be trimmed or bent to suit the exigencies of the case, and is stiff enough to retain the form given to it, can be utilized. After preparing the splint it should be padded, for which purpose cotton-batting, tow, old rags, dried leaves, or hay may serve, these materials being bandaged fast to it on the side which is to come in contact with the injured member. The apparatus is then applied to the limb, an arm, for example, as shown in the figure below, and after carefully adjusting the injured member to the least painful position, as well as to that which is nearest its own natural shape, the splint or splints are fastened in place with several turns of the bandage applied as previously suggested. The adjoining woodcut shows the method of applying the splints for a fracture of both bones of the forearm. After arranging the arm and splints as depicted, the whole should be covered in with a bandage, and suspended by a sling from the neck in such a way as to be carried by the patient across his chest.


Treatment of Fracture of Both Bones of the Forearm.

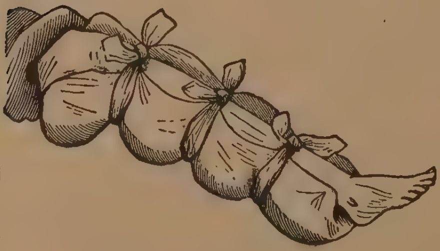
Fracture of Arm.—Fracture of the humerus or arm-bone between the shoulder and elbow should have applied curved splints made of thick pasteboard, wet in boiling water and moulded to the shape, sheet gutta percha similarly softened, or tin, one on the inside and another on the outside, as represented in the figure. The fragments of the bone are to be adjusted in proper position, a bandage applied, and then the splints fitted and firmly yet not too tightly bound on with a bandage running from the tips of the fingers to the shoulder. If the roller is applied above only, the hand and fingers will swell up in consequence of the pressure, interfering very seriously with the circulation of the blood. In fractures of the arm it is always advisable to arrange the elbow bent at a right angle, because should the arm be left stiff, as may happen, perhaps with the best treatment, it is much more useful than when straight.



Fracture of the Humerus.

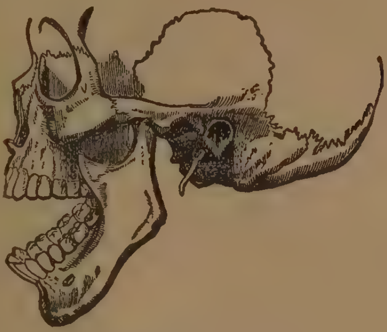
Fracture of Legs.—In fractures of the legs, a contrary rule holds good, and the effort should always be to keep the broken limb as straight as possible.

An excellent temporary dressing for a fracture of the leg below the knee is well indicated in the figure. The injured limb should be drawn out to as nearly its full length as can be borne, measuring it by the sound side to determine this, and then the fragments of the bone pressed, if possible, to their proper places. The pillow which has previously been laid beneath the injured member is then doubled up, as shown in the cut, and fastened with three or four strips of bandage or with handkerchiefs. If the leg is much bruised, or the pain very severe, a soft linen cloth soaked in laudanum, or strong lead-water and laudanum, should be wrapped around it before being bound up in the pillow.



Dressing for Broken Leg.

Dislocations.—Continued displacement of the bones comprising a joint, after the ligaments have been more or less torn, constitutes a dislocation, or, as it is popularly described, "out of joint." These injuries are generally the result of external violence, such as falls, blows, twists, and so forth, which have caused the limbs to move in a direction, or to an extent, for which nature had not adapted them. A familiar example of a dislocation is that of the lower jaw, and the position of the bones composing this important articulation in their disturbed or displaced condition is well shown in the marginal illustration.


Dislocation of the Lower Jaw.

Symptoms of Dislocation.—In a general way, a dislocation is recognized, first, by the altered appearance of the joint, which is usually very apparent when compared with the corresponding joint on the opposite side; second, by the movements of the affected joint being lessened; third, by the fact that efforts to move the joint cause much pain; fourth, dislocation can usually be distinguished from fracture, which, when near a joint, is apt to give rise to all these symptoms, by the absence of crepitus, as the grating noise produced by rubbing together the ends of the fragments is called. This sign, however, would, of course, prove fallacious and misleading if both a fracture and a dislocation existed.

Treatment.—The obvious treatment for a dislocation is reduction, or a replacing of the bones forming the joint again in their proper relations. In reducing a dislocation, not only should the operator have all his anatomy at his fingers' ends, but a vast amount of practical experience is often necessary to decide whether a dislocation is complicated with a fracture, or whether a dislocation or a fracture is the injury to be treated.

So great and so permanent is the injury likely to result from the blunders of attempting to "reduce" a fracture, erroneously supposing it to be a dislocation, or *vice versa*, that no time should be lost by the sufferer in availing himself of the best medical services procurable.

Sprains.—Sprains are injuries resulting from the twisting or tearing of the ligaments of a joint by the effects of a fall or blow. Sometimes the violence of muscular action, or the sudden weight of the body, brought to bear upon a joint when unexpected by the antagonistic muscles, may be the cause of a sprain. The pain is frequently very sharp and severe, and swelling takes place with great rapidity. The most common sprain is that of the ankle, and its effects are so speedily manifested that in the course of a few minutes the patient becomes unable to walk or even put his foot to the ground without great suffering.

Treatment.—Recovery from a sprain takes place slowly, and the serious mistake is often made of considering the injury a trifle. Perfect rest is essential. An affected ankle should be elevated above the hip. For the first few hours ice-water cloths should be held upon the joint by a firm pressure bandage. An ice-bag should be added. After some hours the extremity should be placed upon a splint. Cold applications of water, lead-water and laudanum, or of alcohol and water should be continued. Leeches about the joint do good. Dover's powder for pain may be necessary. Use the constitutional treatment for inflammation. After a day or two hot fomentations with the hot water bag give greater relief. When the pain and other acute symptoms have well subsided, gentle motion and rubbing with liniments help to prevent stiffness. Time is lost by attempting to use the affected limb before it is sufficiently restored.

Foreign Bodies in the Throat.—Foreign bodies in the throat are sometimes substances imprudently swallowed by mistake, such as fish bones, pins, and so forth, or coins, marbles, and other playthings half ignorantly introduced by children. If the breathing is not seriously interfered with, medical assistance, sent for at once, should be awaited, as peculiar forceps and other instruments will probably be necessary to extract the intruders. If choking to death seems imminent from pressure on the windpipe, thumping on the back, holding the patient up by the heels, and striving to hook out or push the foreign body, if it is not intrinsically dangerous, down into the stomach, may all be tried. At the last gasp the operation of tracheotomy, or opening the windpipe, should be performed by any one who has the knowledge and the courage to attempt it.

Foreign Bodies in the Nose.—Foreign bodies in the nose are generally beads, buttons, beans, and so forth, pushed up by children with the usual desire to see what they will do. They may sometimes be driven out by violent sneezing excited by snuff, or by tickling the inside of the nostril with a feather. If such treatment is not effective, the case should be referred to a physician, who can as a rule readily remove such objects with suitable instruments.

Foreign Bodies in the Eye.—Should a particle in the eye lie beneath the lower lid, it can generally be extracted by pulling down the eyelid, searching out the object by the aid of a bright light and a magnifying glass, and wiping it off with the corner of a fine handkerchief, or with a little brush made by gently twisting a bit of absorbent cotton on the end of a wooden toothpick. Objects beneath the upper lid are more difficult to manage. If the popular mode of wiping the inside of the upper lid with edge of the lower one over which it is drawn down, fails to give relief, the lid should be at once turned inside out. This little operation is performed by taking hold of the eye-lashes, pulling out the lid from the eye, and having the patient look down at his feet just as you press the back part of the lid down with a bodkin or small lead-pencil laid across it above the eye. The particle will generally be found adhering to the under surface of the lid, and, when detected, should be removed as before advised.

Foreign Bodies in the Ear.—Foreign bodies in the ear, including insects, may generally be removed by syringing with plain boiled tepid water. This is far safer than to attempt to remove objects with instruments. Should an insect gain entrance to the ear and no syringe be at hand, let the patient lie down upon the opposite side and fill the auditory canal with warm water. This will kill the insect and may float it out of the canal.

Burns and Scalds.—Even when small and slight, the suffering produced by burns is severe; when extensive, they are dangerous, and if the whole body is involved certain death is the result. Burns are caused by fire, or by chemical agents applied directly to the surface, destroying the skin, and, to a greater or less extent, the tissues underneath. Scalds are produced by the contact of boiling liquids or steam. The three degrees of a burn are, first, mere painful redness, caused by superficial inflammation of the cutaneous surface; second, the formation of blisters; third, charring of the skin, and, perhaps, of the deeper structures. Probably the most frequent cases of fatal burning are from the clothes taking fire.

When the Clothing Takes Fire, the person, if alone, should throw himself flat upon the floor, and strive to smother the flame by wrapping around him a rug, shawl, coat, or any woolen article within reach. If any other person is present, he should instantly trip or knock down the sufferer, and use his coat or the first woolen article which comes to hand to smother out the fire; then procure water as quickly as possible, and drench the patient with it. In the terrible cases which occur where the entire body is one vast blister, the best way is to give a large hypodermic injection of morphia, or a full dose of laudanum, and roll the patient in a sheet after covering the body with sweet oil and dusting it with flour.

Treatment.—For the local treatment of slight burns, including sunburns, nothing gives more relief than that of wrapping the part in cloths kept wet with a strong solution of baking soda or dilute phenol-sodique (one to eight parts of water). Carron oil (a mixture of lime-water and linseed oil), or an application of white-lead paint, relieve pain, but are apt to be followed by much suppuration.

Severe Burns.—In severe burns an effort should be made to dress antiseptically. Cleansing should be done by sponging with hydrogen peroxide, following with boric acid solution, or a solution of common salt, one teaspoonful to the pint of water. Blisters should be pricked with an aseptic needle. One of the most grateful dressings is that of soft cloths kept wet with the salt solution. Or, after cleansing as suggested, the wound may be dried and dressed, boric acid powder and plentiful dry aseptic absorbent cotton being applied. Carbolized sweet oil may be used. Burns from falling into a lime-kiln or a kettle of soap-lye should be treated with plenty of cool water, and then washed with diluted vinegar, except where the skin is broken, to neutralize the alkali; afterwards, the burns which remain are to be dressed as directed for those which have been produced by fire. Burns from acids, such as nitric acid or oil of vitriol, should, on the contrary, be treated by profuse washing with lime-water, a solution of baking soda, or any other alkali which can be procured.

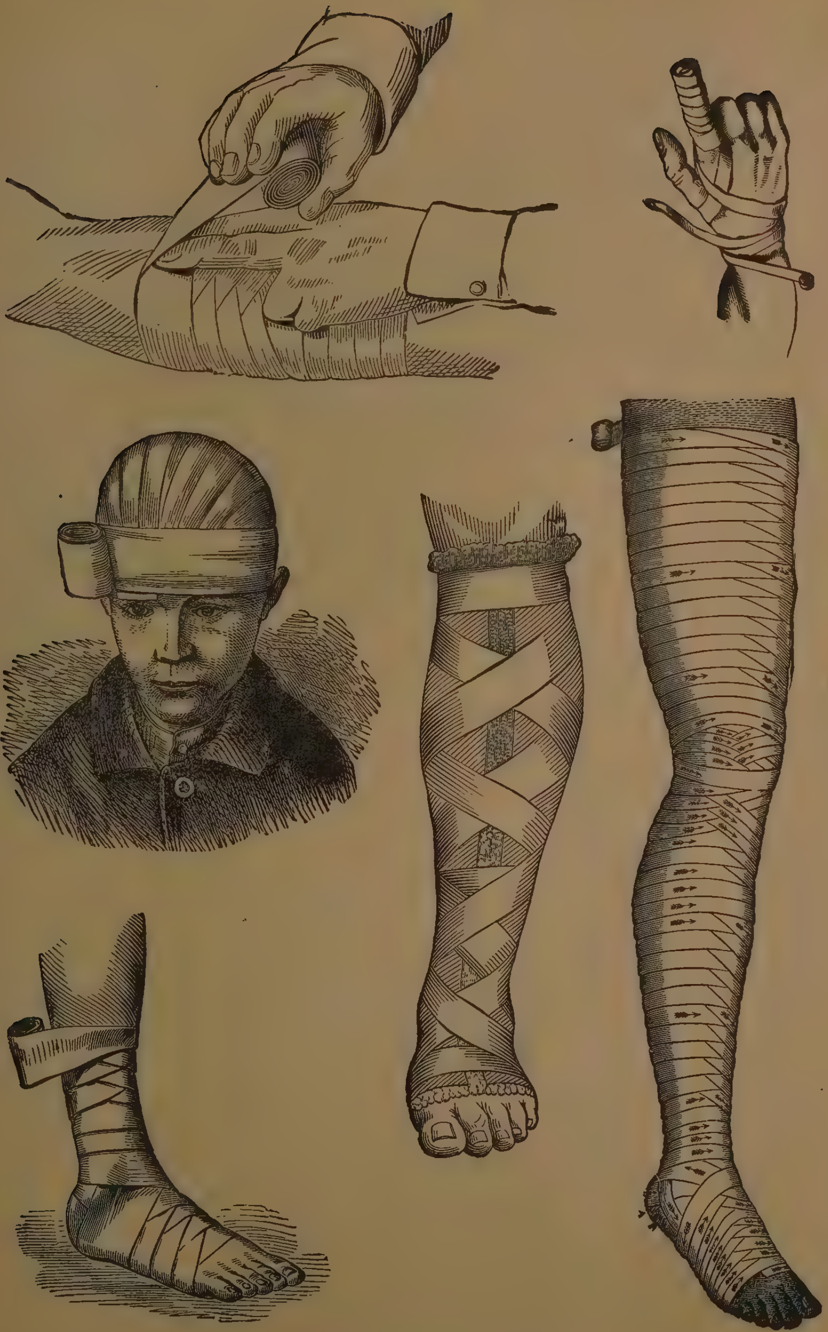
Extensive burns are very dangerous and require the attention of a physician to direct constitutional as well as local treatment.

Frost Bite.—A sufferer from frost bite should not be suddenly brought into a warm room. A frost bite should be gently rubbed with snow or ice-water cloths, thus reëstablishing the circulation gradually. The part should later be wrapped in cotton wool and should be put at rest in an elevated position.

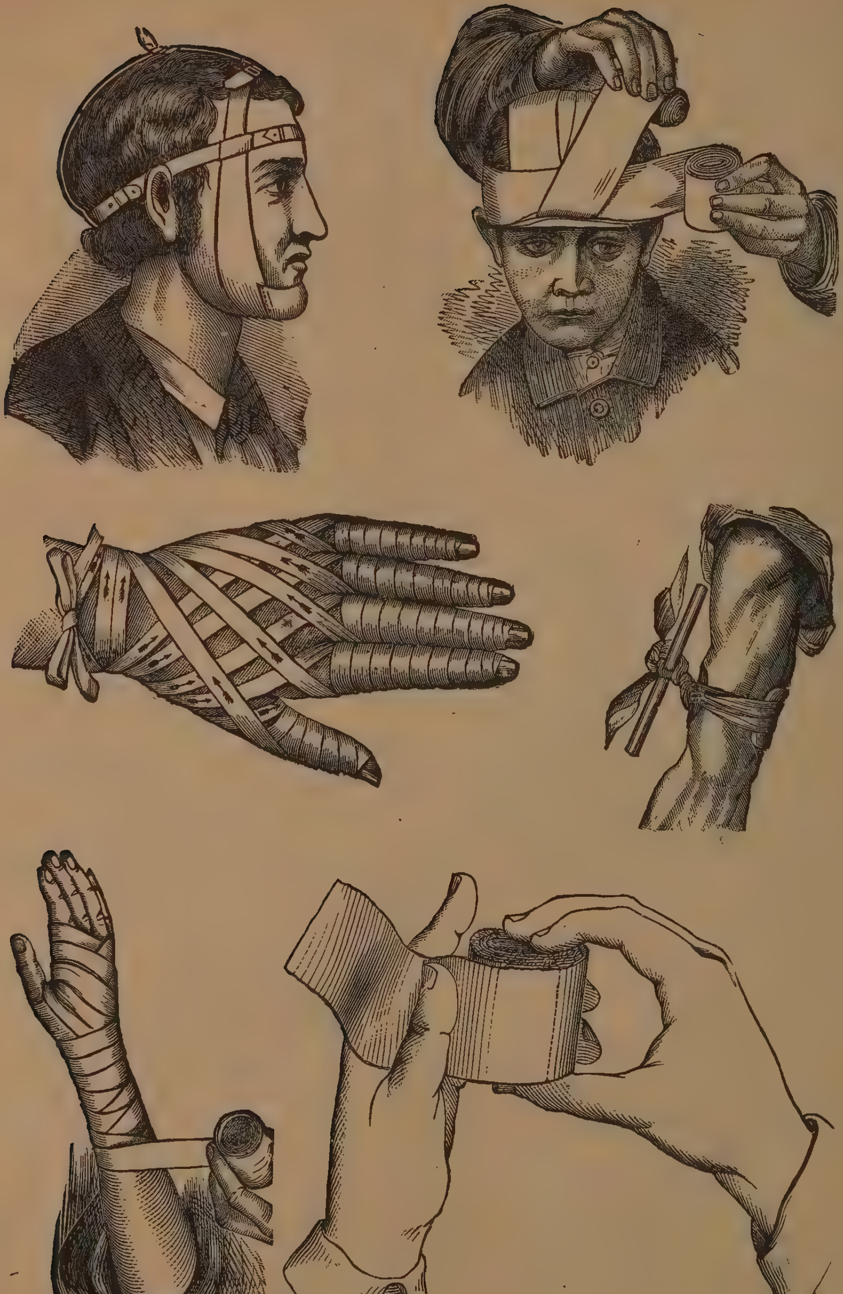
Injuries by Electricity.—Whether electrical shock be by lightning-stroke or by artificial current the treatment is similar. Make traction upon the tongue and artificial respiration as directed under the subject of Anesthesia. Do not give alcoholic stimulants. Apply cold to the head, apply a mustard plaster to the back of the neck and another over the heart. Wrap the patient in warm blankets and give rectal injection of hot salt solution. If a person is in contact with a live wire, first, if possible, shut off the current. If this cannot be done catch a portion of the clothing of the victim and pull him away from the wire; or handle him with rubber gloves or by wrapping the hands in dry cloths.

Rupture or Hernia.—By the above is commonly meant the protrusion of some organ of the abdomen through the walls of the latter. The most common contents of hernia are bowel or omentum. The commonest sites are at the navel and the groin.

The fact that persons so affected are often induced to entrust themselves to the treatment of quacks or charlatans is deplorable. Serious



BANDAGES.—Figure No. 1.



BANDAGES.—Figure No. 2.

results often occur. There are only two forms of proper treatment, namely, either the wearing of a truss fitted and adjusted by a skilled person or submission to surgical treatment at the hands of a reputable surgeon for the radical cure of the condition.

Apparent Death from Vapors.—When a person is overcome by illuminating gas or other noxious vapor he should be quickly removed from its presence into fresh air. The clothing should be loosened, the tongue drawn out and rhythmical traction be made upon it. The mouth and throat should be wiped free from mucus. Artificial respiration should be practiced. Meanwhile external heat should be applied and active stimulation given hypodermically or by the bowel. If respiration begins to be restored oxygen should be given by inhalation.

Apparent Death from Hanging.—After cutting the patient down the principles of treatment are similar to those applied in the case of asphyxiation from vapors.

Ivy Poisoning.—This is a condition caused commonly by the poison-oak or poison-ivy. It is characterized by redness, burning, itching and generally by swelling with a vesicular eruption.

Valuable applications are those of cloths wet with lead-water and laudanum, black wash or phenol-sodique one part, water eight parts. Mild ointments give relief, especially oxide of zinc ointment containing ten grains of carbolic acid to the ounce.

BANDAGING.

Bandages may be made of gauze, cotton, flannel, rubber, muslin, etc. They are used to hold splints or other dressings in place, to give support, to make compressions, and to correct deformity. When desirable to have a part absolutely rigid starch, silicate of sodium, plaster-of-paris or like material may be incorporated in the bandage.

Bandages are named from their shape, use, mode of application, from a fanced resemblance to something, or from the name of their inventors.

The Roller Bandage (Fig. 2) is usually made of unbleached muslin which has been washed in soda solution to remove the sizing and then torn into strips varying from one to five inches in width and from three to ten yards long, according to the part to be bandaged.

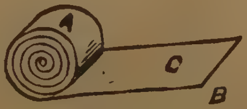


Figure No. 2.

The cut (Fig. 1) represents the simplest and best variety of machine for rolling bandages. It consists of a framework, through the upper part of which passes a square bar (rounded where it corresponds to the uprights) with a handle attached.

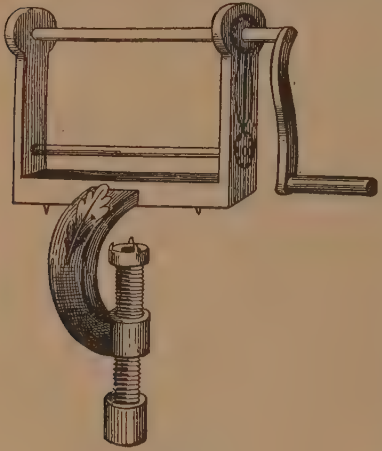


Figure No. 1.

The strip of muslin being spread out, one end is passed beneath the lower bar seen in the cut, and then over the upper one, which being turned by the other hand, soon rolls the whole bandage. After it has been rolled up, it should be seized with the left hand and held firmly while the crank is turned in the same direction, so as to still more tighten up the bandage. Then reverse the crank which will allow the spindle to be withdrawn.

The bandages may also be rolled by hand. The edges should be kept true, the loose threads picked off, and the end of the bandage secured with a pin.

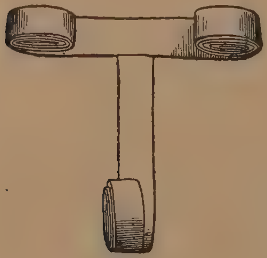


Figure No. 3.

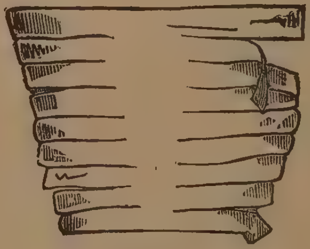


Figure No. 4.

The T Bandage (Fig. 3) is made by sewing one piece of bandage at right angles to another, is used to retain dressings between the thighs. One part of the bandage is tied around the waist, the stem of the T passing between the legs, then being brought up and tied to the first part.

The Many-tailed Bandage (Fig. 4) is used principally after abdominal operations. On applying it the central portion is placed over the spine, and beginning at the top, the first tail on one side, then the first tail on the opposite side is brought across the abdomen, so alternating and overlapping until all the tails are used.

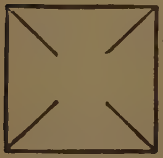


Figure No. 5.

The Maltese Cross is used to retain dressing on stumps after amputation of a limb, the ends folding smoothly over the operative field.

The Circular Bandage consists of several circular turns around a part and is used to stop hemorrhage, make veins prominent before blood-letting, and to retain dressings when limited to small area.

The Recurrent Bandage is applied to various parts. To adjust it to the head make several turns around the head (Fig. 8), then pass the bandage backward and forward over the scalp until the parts are covered. Secure the turns with pins or strips of adhesive plaster.

The Oblique Bandage is begun by several circular turns and is then carried up the limb like the red band on a barber pole. It is rarely used.

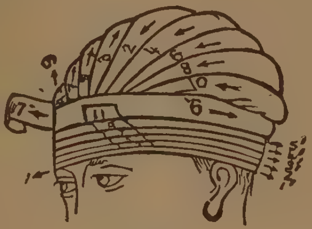


Figure No. 8.

The Spiral Bandage (Fig. 18) is applied to parts which do not vary in circumference. It is applied like the oblique except that the turns overlap each other. Figure 33 illustrates the spiral bandage applied to

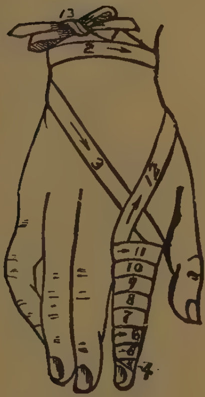


Figure No. 18.

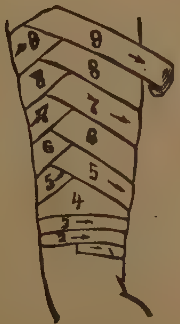


Figure No. 6.

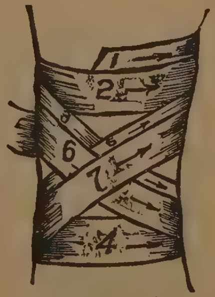


Figure No. 40.

the chest. Figure 24 demonstrates the application of the spiral bandage to the hand and wrist.

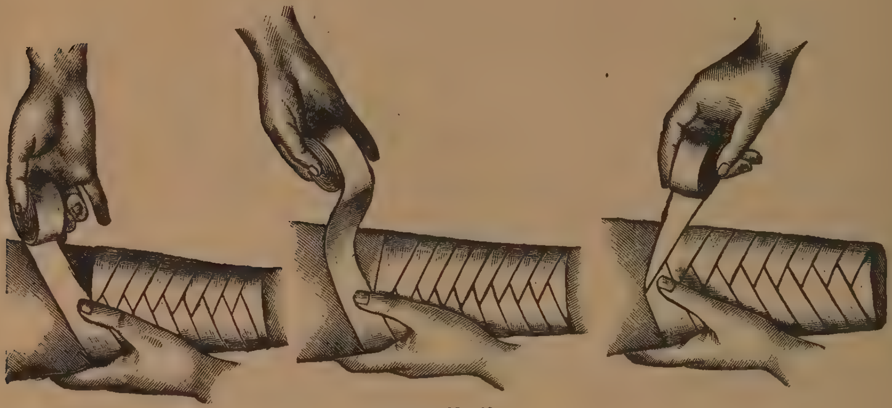


Figure No. 42.

The Spiral Reversed Bandage (Fig. 42) is applied to parts which are conical. It is begun like the spiral, but as the leg begins to thicken it will be found that the lower edge of the bandage does not lie snugly against the limb. In order to obviate this reverse each turn of the bandage, *i. e.*, the upper edge of the bandage becomes the lower edge. Overlap each preceding turn of the bandage at least one-half.

To confine the bandage the end should be folded on itself, the corners again folded under and a pin should be passed in the direction from which the end of the bandage has come.

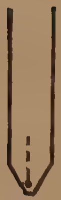


Fig. No. 7.

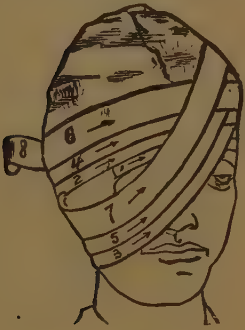
The Figure of Eight Bandage is applied to the knee, elbow, chest, axilla and occiput. Make several circular turns around the limb to fasten, pass obliquely downward over the flexor side of the joint to the opposite side, make a circular turn below the joint, and pass obliquely up again. The figure of eight is repeated, overlapping the turns until the part is covered.

Figures 12 and 13 show the method of applying the figure of eight to the eyes to retain dressing, exclude light, and so forth.

Figure 20 shows an excellent method of binding up the hand and wrist by means of a folded handkerchief in times of emergency. Care should be taken not to allow any tight constriction around the wrist for a prolonged period, as death of the fingers may result.

In Figure 21 the same principle, the figure of eight, is utilized to cover the back of the hand and wrist.

In Figure 37 the figure of eight is employed to cover the instep.



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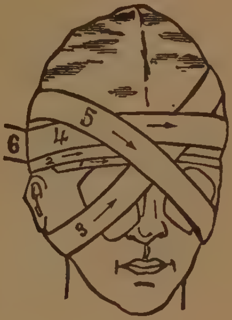
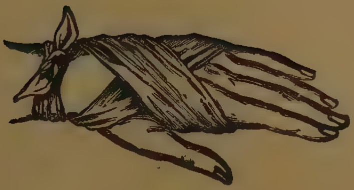


Figure No. 13.

The bandage is fastened by circular turns above the ankle, and is then applied as above described.

The Spica Bandage is a figure of eight bandage, each turn overlapping the previous one so as to resembled a spike of barley. When the turns overlap each other from below upward the bandage is called an ascending spica; when from above downward, a descending spica. When the turns cross in front it is termed an anterior spica; in back, a posterior



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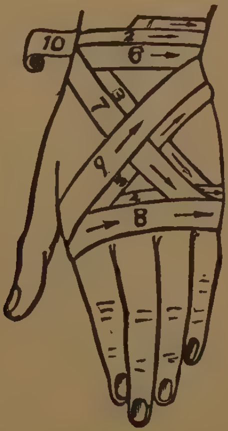
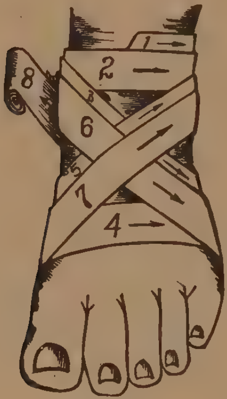


Figure No. 21.

spica; and on the side, a lateral spica; when two corresponding parts like the groins are covered, the bandage is known as a double spica.

The Four-tailed Bandage is made by taking a square or oblong piece of flannel or muslin, and tearing toward the centre from opposite sides, so as to make four tails. The size depends on the size of the part to be covered.



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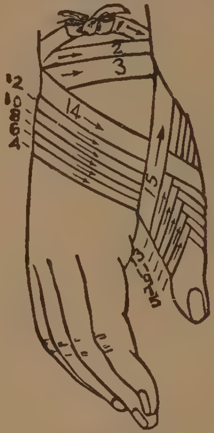
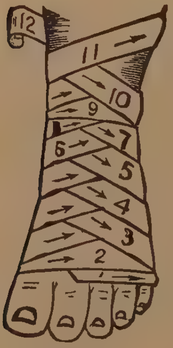


Figure No. 19.

Figure 9 illustrates the four-tailed bandage adjusted to the head.

For the instep make the bandage about twenty inches long and about five inches wide. Double it and tear down the centre, leaving a square portion untorn. Apply it by placing the central square portion across the instep; bring the two upper ends up around the leg and tie them; the lower ends are to be brought about the lower part of the foot and tied



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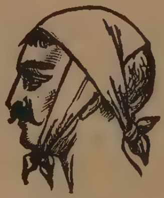
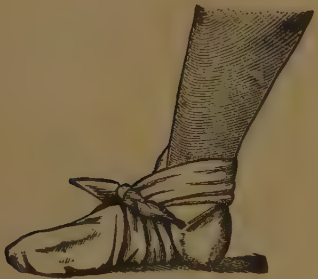


Figure No. 9.

in a similar manner. This bandage is very effective in confining dressings to the instep and lower part of the leg. It may also be applied to the heel.



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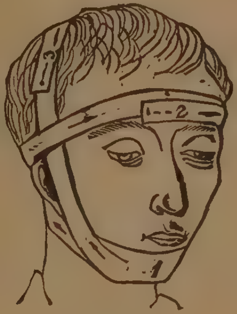


Figure No. 15.

For the knee take a strip of muslin eight inches wide and about thirty inches long; tear each end down the middle to within six inches of the centre. Apply the central portion over the patella, bring the upper ends of the bandage around behind the knee, passing obliquely downward, and tie on the front of the leg below the knee pan; the lower ends

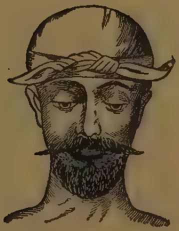


Figure No. 10.

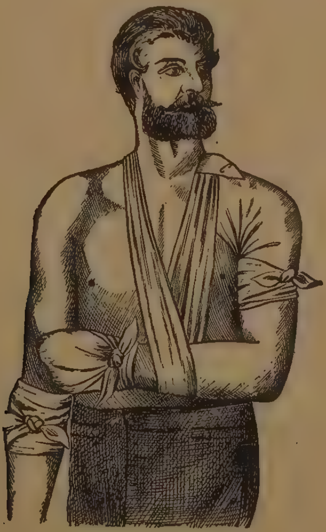
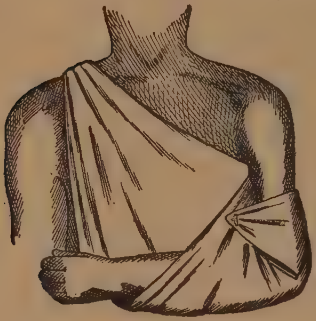


Figure No. 26.

should be crossed behind in a similar manner, and tied on the front of the thigh above the knee pan.

Figure 15 shows the four-tailed bandage applied to the chin.



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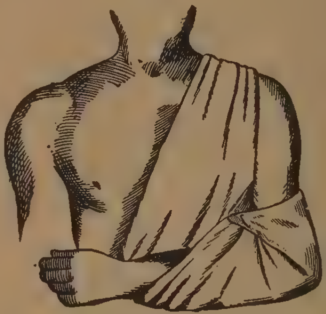
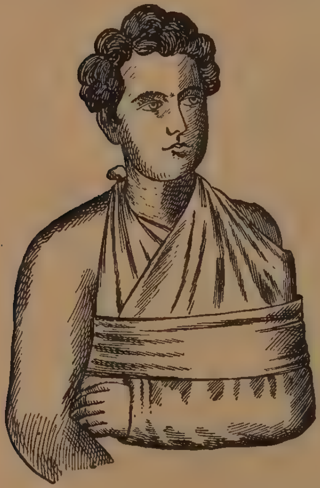


Figure No. 28.

The Triangular Bandage by skillful manipulation has been made to perform many and varied offices.

Figure 10 shows the ordinary triangular bandage applied to the scalp in a manner somewhat like that adopted by women to protect the hair from dust when sweeping.



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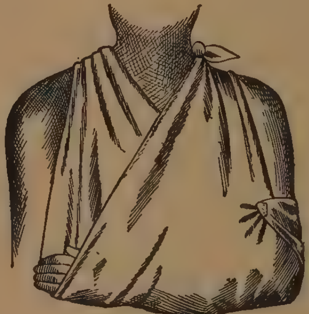
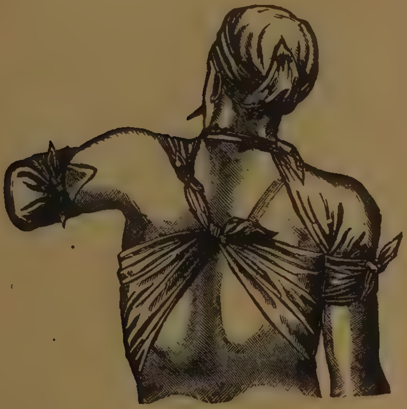


Figure No. 30.

In Figure 26 the methods of binding the shoulder, elbow and hand are shown, as well as the use of the triangular bandage for a sling.

In Figure 27 the triangular sling is so adjusted as to support the arm and elbow, the weight resting on the right shoulder only.

In Figure 28 the same bandage is depicted, except that the weight of the forearm falls on the left shoulder.



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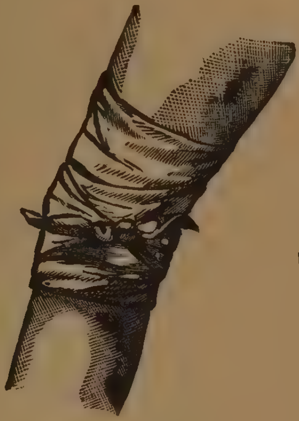
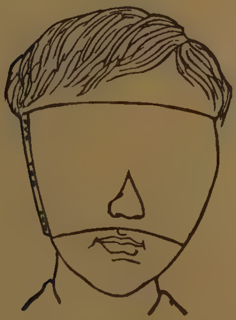


Figure No. 41.

In Figure 29 the bandage is so applied that it cannot be removed by a child or restless patient.



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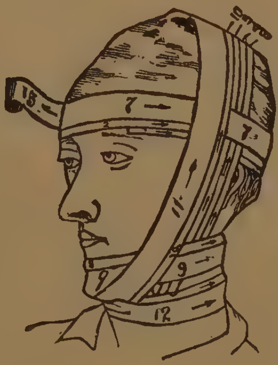
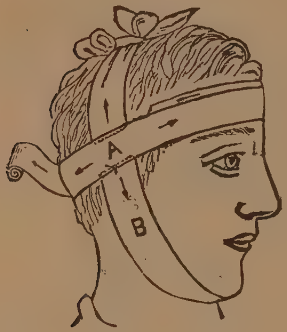


Figure No. 14.

Figure 30 shows the triangular sling applied in the usual way, the weight being supported by both shoulders.

Figure 31 shows the triangular bandage applied to the chest, shoulder, head and elbow.

In applying the triangular bandage to the knee take a triangle of muslin, the base being about two feet long and the apex about ten inches from the base. Place the centre of the base across the front of the knee just above the knee pan; bring the ends around as many times as possible and tie them. Dressings are easily held on by this method, and much support is given in cases of fracture of the knee pan.



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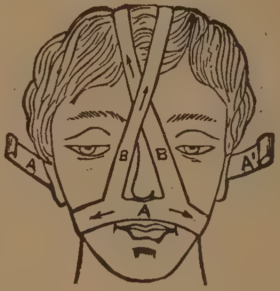

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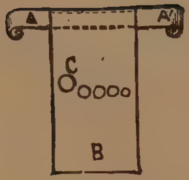

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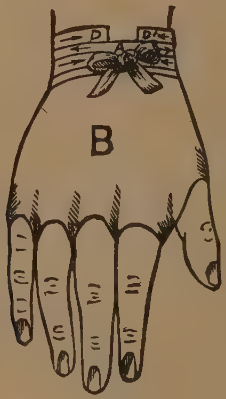


Figure No. 23.

The Fillet or Head Band.—Take a piece of flannel twenty-five to thirty inches long and about ten inches wide. At the centre of the bandage, one-half inch from the lower edge, cut a triangular hole large enough for the nose. Stand behind the patient and place the bandage over the face, the nose projecting through the hole, the remainder of the upper part of the face being covered. The ends are brought together behind and pinned. This is an admirable dressing for retaining dressings on the face and eyes, especially in burns of the face.

Bandage for the Chin.—This bandage should be one and a half inches wide and about nine yards long. Standing at the back of the patient, the end of the bandage is placed just over the left eyebrow, and fastened by one horizontal turn around the head, then passing around to and below the right ear, underneath the chin, and upward over the left side of the face, just covering the left ear. Two more turns are to be made over the top of the head and underneath the chin, each turn including a little more of the anterior part of the chin. The bandage is now to be continued around behind the neck, and, in a slanting direction, over the head and around the forehead, as before, and then again below the right ear and across the front of the chin and around the neck, drawing this part quite snug, and repeating; then passing under the chin and up on the left side of the face, bring the bandage to the top of the head and confine by several turns.

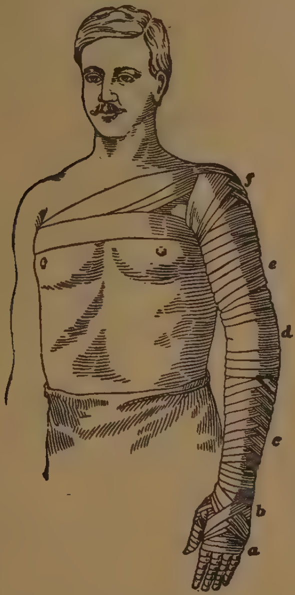


Figure No. 25.

It is used for fracture of the lower jaw, and for holding poultices to the side of the face, and so forth. If any turns be made about the neck, care should be taken that they are not drawn tight enough to interfere with the circulation.

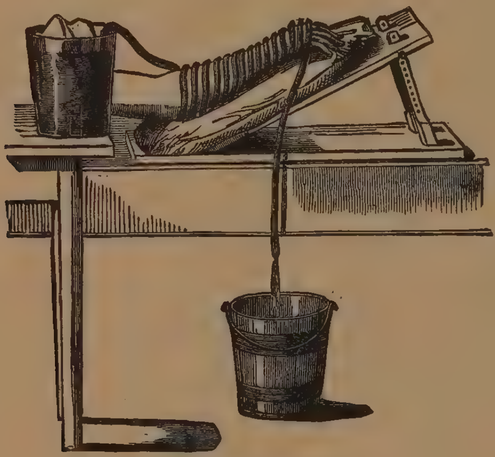
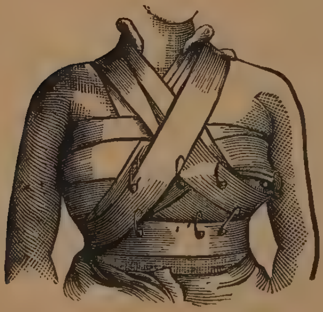


Figure No. 82.

T-Bandage for the Temple.—Take two pieces of muslin, one two to four inches wide and three feet long; ten to twelve inches from one end, at right angles to it, another bandage should be fastened, two inches wide and seven to eight feet long, one end only extending fifteen to eighteen inches beyond the point of junction.



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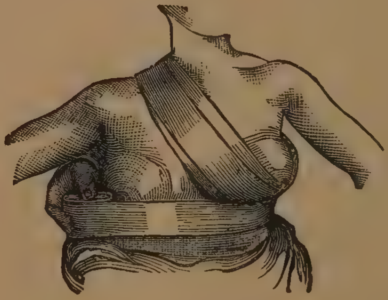
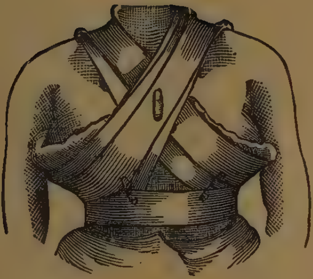


Figure No. 35.

Place the point of junction of the bandage over the injured temple in such a manner that the wide part of the bandage is perpendicular as regards the head; the short end is to be brought to the top of the head and the long end around under the chin and fastened to the opposite end. The narrow part of the bandage is now carried around the head horizontally, the short end being confined by the horizontal turns.

Double T-Bandage for the Nose.—Take a muslin bandage seven to eight feet long and one inch wide. At the centre of this, about one inch from each other, and at right angles to the first, stitch two other strips each two and one-half feet long by three-quarters of an inch wide.



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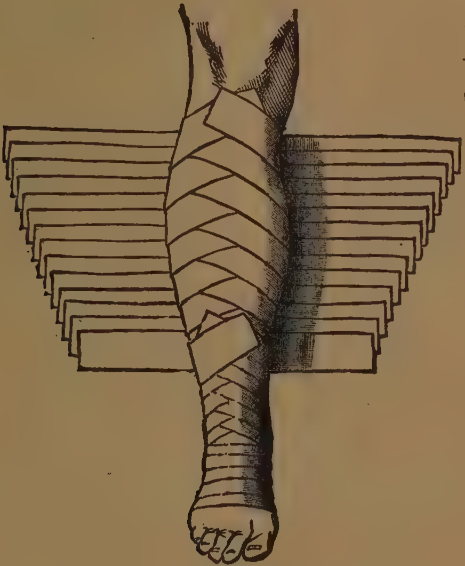


Figure No. 43.

Place the centre of the main bandage beneath the nose (the two shorter pieces passing up on each side, crossing at its base and resting on the top of the head), carry the ends around to the back of the head where they cross and are again brought around to the forehead, where they may be confined after taking several circular turns about the head. The ends passing over the top of the head may pass down behind and be pinned to the main bandage. This bandage is of use in keeping dressings about the nose in position.

Perforated Bandage for the Hand.—Take a roller bandage eighteen inches long and one inch wide, and to the centre of this stitch a piece of linen one foot long and four inches wide, with five perforations, as in Figure 22.

Pass the thumb and finger through the holes, double the ends over the wrist and secure with the roller bandage.

Figure 25 shows how the whole upper extremity may be covered by bandaging. Each division of the arm may be taken separately to show the method of applying a bandage to any part of the arm.

Figure 32 shows a very useful apparatus for applying continuous cold to an inflamed member; it may be just as easily applied to the head or lower extremity. It consists essentially of a vessel with ice water, a rubber tube and a support for the arm.

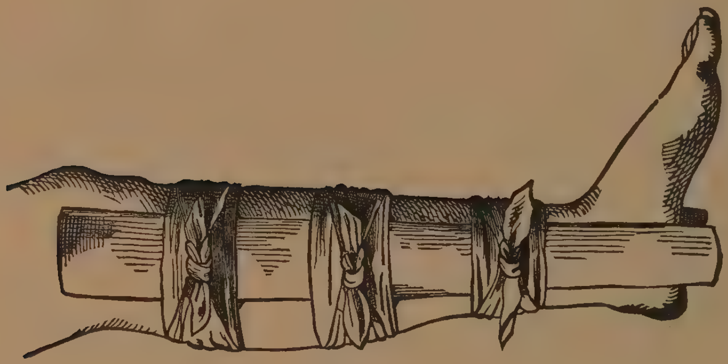


Figure No. 44.

Bandages for the Breast.—We will assume the left breast is to be supported. It is first covered with a layer of cotton; then applying the end of the bandage about the centre of the back, holding it in place with one hand and with the other bringing the roller under the arm and breast, then across the chest and over the right shoulder, then under the arm and breast again until it is covered; the bandage should now pass across the chest at the level of the lower end of the breast-bone, below the opposite breast, and around behind, where it may be confined.

When both breasts are to be supported the bandage should pass across the left shoulder also and below the right breast in the same manner.

Figure 43 shows the manner of covering the leg with adhesive plaster cut in strips, each strip being longer than the preceding and overlapping it. Pieces of bandage may be used in making a many-tailed bandage.

Figure 44 shows how a fractured limb may be put up temporarily by using two straight pieces of wood and several handkerchiefs. The limb should be covered with cotton or some other soft substance.

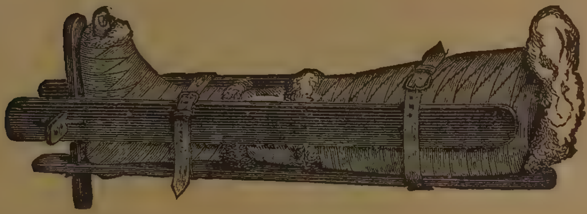


Figure No. 45.

Figure 45 shows the construction and use of a very efficient apparatus for the leg, especially when the fracture is of the compound variety.

CURATIVE MEDICINE.

PART XIV.

ANESTHETICS AND SOPORIFICS.

Discovery of Anesthetics.—The victories of peace often far surpass in result the renown which they receive. Such was the achievement of Thomas G. Morton, a dentist, who, October 16th, 1846, for the first time produced complete anesthesia or insensibility to pain under a major surgical operation. This occurred in the clinic of the celebrated surgeon, Dr. John C. Warren, at the Massachusetts General Hospital. These men, by their discovery, not only wrought a revolution in surgery, but were victors over the horrible agony previously suffered at the hands of the surgeon. Their labors have brought to pass what Dr. Oliver Wendell Holmes has written: "The fierce extremity of suffering has been steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony has been smoothed forever."

Spread of the Discovery.—News of this remarkable discovery seemed to be carried by the winds, and soon anesthesia was used in the clinics of the world. The following year, chloroform was introduced by Sir James Simpson, of Edinborough. Such a boon to humanity is beyond estimation. The agony suffered under a severe surgical operation only the few courageous ones enduring it and yet surviving, can tell. Anesthesia now renders comparatively easy very many new procedures, especially those requiring the greatest delicacy of touch and accuracy in dissection of brain or amid vessels and nerves—procedures not possible in the haste necessary before the days of anesthesia. Then, too, the operations were formerly few; now relief is for the many. The numbers rapidly multiplied many fold. For example, in the Massachusetts General Hospital during five years previous to the introduction of anesthesia, only 184 persons were willing to submit themselves to the ordeal of an operation In the five years following, 487 operations were done, and, in 1899, in the same hospital, 3700 operations were performed. Anesthesia is a benign alleviator of suffering, a merciful prolonger and saver of life.

ANESTHETICS.

Anesthetics, artificial means of producing insensibility or loss of feeling, are general and local.

General Anesthetics.—The more common ones are ether, chloroform, nitrous oxide, and ethyl bromid. They are given by inhalation, and commonly more or less mixed with air or oxygen. The chief uses of general anesthesia are, to abolish the pain of labor and surgical procedures; to produce muscular relaxation in ruptures, fractures and dislocations; and to enable the physician to make examinations otherwise painful.

Preparation of Patient.—In emergencies, a patient sometimes must needs be given an anesthetic without previous preparation, but, when time affords, preparation should never be omitted. The dangers from an anesthetic are commonly magnified by the laity, yet a skilled anesthetizer, while not afraid, should have a wholesome respect for the complications which are always possible to arise. The better condition a patient is in at the time of giving an anesthetic, so much the less likely are serious results. Therefore the advisability of attention to the patient and his preparation previous to operation. The condition of lungs, heart, and kidneys is especially to be noted, the urine examined for albumen, casts and sugar. While the presence of the latter do not absolutely contraindicate the giving of an anesthetic, yet they may at least influence in the selection of the kind, and lead to special necessary precaution in its giving.

The Bowels.—The bowels should be freely emptied the day before or the morning of operation. This is well done by epsom or rochelle salts, one to two tablespoonfuls, supplemented, if need be, by an enema of soap-suds one quart, glycerin two tablespoonfuls, epsom salts two tablespoonfuls. The injection should be given a few hours before operation. The bladder should also be emptied immediately before operation.

Rest and Sleep.—The patient should rest for twenty-four hours previous, preferably in bed. He should have a general bath, that the skin may be active. Sleep should be secured the night previous; if there is nervousness, a warm bath at night may quiet, or it may be necessary to give a powder of potassium bromide, ten grains, or of trional, fifteen grains, in a little hot broth or hot tea; either may be repeated. The anxiety of the patient may interfere with digestion. At any rate, the diet for a day previous should be light, for example, broths, soups, soft eggs, bread and butter, toast. At the time of giving an anesthetic the stomach should be empty. If operation is to be early in the morning, no breakfast should be given. A small quantity of beef tea or of broth and a little brandy may be well. If operation is not until midday, a light breakfast of beef tea or of broth and toast or a roll had best be taken. Never give any food within three hours of operation, and only a very moderate quantity of water within the same time. Matter in the stomach induces vomiting, and this endangers the patient to the entrance of portions of food into the windpipe.

Temperature of Room.—The room should be warm, not less than 70 degrees Fahrenheit, and the patient protected with sufficient blankets. If a light in the room is necessary, it should be above and some little distance from the patient. Ether is inflammable, and the vapor explosive, but the latter sinks to the floor. The clothing should be loose, particularly about the neck and body. If a woman, the corsets should of course be removed to give opportunity, if only this once, for free breathing. The hair should be braided. A third party should always be present. The patient should lie upon the back with only a small pillow beneath the head. Take care that the limbs are not cramped or pressed upon. The lips and nose should be anointed with vaseline. Having spoken some cheerful, encouraging word to the patient, the anesthetizer examines the heart, notes the condition of the pulse and respiration, and, without fail, sees that any foreign bodies in the mouth, including false teeth, are removed. He is now ready for the administration of the anesthetic.

Giving Ether.—The writer desires to state, in most emphatic terms, that an anesthetic should never be given by any but a skilled person or under the direction of such a person—one who can interpret danger signals, and can act promptly and intelligently. The limits of this work forbid giving detailed directions. Some of the salient points regarding the giving of ether may prove of benefit as well as of interest.

What the Operator Will Have in Hand.—The anesthetizer will have at hand stimulants—brandy, strychnine, atropine, digitalis and a hypodermic syringe in working order. He will have a mouth-gag and tongue forceps, and needs at hand two or three small towels. Ether is best given upon some simple inhaler, such as an Allis, but may be well given upon a towel folded into a cone, or, if the face be anointed, the folded towel may be placed flat over the patient's nose and mouth. Having gained the confidence of the patient, by assurances that he will give the anesthetic slow and will not choke him, the anesthetist says, "I want you to breathe through the inhaler a few moments to get used to it before I put any ether upon it. Now just a drop or two." So beginning, and continuing very slowly, "feeling" his way, the anesthetist may have reasonable hope that he will avoid any serious trouble in the stage of excitement. If choking or coughing occurs at first, proceed very gradually, giving a breath or two of pure air, and the throat will soon become accustomed to the drug which at first irritates. Vomiting thus early demands the withdrawal of the drug for a few moments, until the throat and mouth are freed from the vomitus.

Pushing the Anesthetic.—After primary irritation ceases, the anesthetic may be "pushed," more and more being added, until, when the patient is in the second semi-conscious excitable stage, he may be getting a large quantity. "Pushing" the drug at this point will quickly send the patient over the period of disturbance into the quiet of complete anesthesia. If, however, very violent struggling with rigidity and great cyanosis, or blueness occurs at this time, it is generally wise partially to withhold the anesthetic for a few moments.

Signs of Perfect Anesthetization.—A patient is known to be completely anesthetized by the loss of consciousness, loss of motion, relaxation of the muscles, loss of certain movements, *e. g.*, that of winking when the eyeball is gently touched. The breathing should be regular and quiet. The anesthetizer not only observes the movements of the chest in respiration, but notes by touch and sound the rhythmical inflow and outflow of air. The breathing and circulation are especial indexes as to the condition of the patient. The regularity, rate, and strength of the pulse should be frequently noted. Any marked variation from the normal should receive immediate attention. Stimulation may be needed or withdrawal of the anesthetic demanded. The color of the patient is also a valuable index. Great pallor generally indicates failure in the circulation; cyanosis or blueness, that the inhalation of oxygen is insufficient. The latter generally calls for removal of the drug and a determination and correction at once of the cause of imperfect inspiration.

Complications.—Irritation apt to arise early in the administration has been alluded to. If vomiting occurs, the head is always to be turned to one side and the mouth wiped out. In a large majority of cases vomiting may be stopped by increasing the quantity of the anesthetic.

The Respiration.—Before complete anesthesia occurs the patient may "forget" to breathe; the word "breathe" spoken loudly into his ear will generally arouse him to efforts of respiration. If after complete anesthesia the respiration is abnormal, the immediate determination of the cause and its correction are imperative. A muscular movement at such time will generally indicate recovery from the anesthesia and the necessity for an increased quantity of the drug. Otherwise, the anesthetic should be stopped, the mouth gagged open, the tongue pulled forward with forceps or towel, and mucus collected in the throat wiped out. This will generally be sufficient to restore breathing and to relieve the cyanosis, allowing the administration soon to be resumed. Should these means fail, artificial respiration should be instituted (which see below). The foot of the bed should be raised, fresh air admitted to the room, the patient well protected and surrounded by hot-water bottles. Meanwhile, various means of stimulation should also be used—hypodermic injections of strychnine, atropine, digitalis, ammonia; injections into the bowel of hot black coffee and brandy; a mustard plaster applied over the heart.

Artificial Respiration.—Laborde's Method. The jaws are held apart and the mucus wiped from the mouth and throat. The tongue is grasped with forceps or the fingers covered with a towel, and is drawn every four seconds, strongly and quickly forward, and each time allowed to go gradually back.

Sylvester's Method.—The former method should be used in conjunction with this. The patient is in a recumbent posture. The operator grasps both the patient's arms near the elbow and draws them gradually outward and upward until they nearly touch the patient's head. They are thus held for two seconds, while air enters the lungs. The arms are then gradually lowered and pressed firmly against the side and front of the chest for two seconds, thus forcing air out of the lungs. The movement of elevation and depression should be made not more than fifteen or eighteen times a minute.

Giving Chloroform.—Ether is a safer anesthetic for most purposes than chloroform. The latter is preferable, however, in a few conditions, *e. g.*, in infants and the very old; in serious lung and kidney trouble chloroform, because of the less quantity required, is less irritating. In certain operations about the face the patient can better be kept anesthetized by chloroform, and it is often better suited for employment in labor, because more quick in action and more relaxing.

Giving Ether.—The general principles for giving ether apply to the giving of chloroform. However, because chloroform is quicker in action, it should be given with greater care. Ether, like alcohol, is a stimulant to the heart, and is therefore generally preferred in heart disease. Chloroform has clinically a distinct depressant action upon that organ.

How to Give Chloroform.—Chloroform may be well given upon a folded towel or napkin, or piece of cheese-cloth. The object from which the chloroform is inhaled must not be held in contact with the face but an inch or more above the nose so that the vapor may be freely mingled with air. Chloroform should be given drop by drop, cautiously, and particular watch-care given for danger signals. If struggling occurs it is imperative that the drug be not "pushed" lest, at this time, when breathing deeply, the patient inhales at a few breaths an overwhelming quantity. Eternal vigilance is the price of safety in anesthesia and especially so in the giving of chloroform.

Nitrous Oxide.—Nitrous oxide or laughing gas is perhaps the safest general anesthetic. Its action is rapid, anesthesia resulting in one minute. But its effect is fleeting, lasting less than one minute, thus rendering it unfit for major operations. It is much used by dentists for the extraction of teeth and has been used with advantage in minor surgery, such as opening an abscess. The gas (a liquid under pressure in steel cylinders) is bulky and not readily carried by the surgeon; the apparatus necessary for its use together with other agents is complicated, so that this drug is not likely soon to become popular in surgery.

Ethyl Bromide.—This, a colorless agreeable liquid, has not been widely used, but not a few, notably Dr. E. E. Montgomery and Dr. Wilmer Krusen, praise it highly where anesthesia of short duration is desired. In giving it to an adult it is well to pour from four to six teaspoonfuls, the whole amount to be given, upon a folded towel, and to apply the saturated surface directly to the nose of the patient, pressing the edges of the towel down upon the face to exclude the air. Unconsciousness is obtained in about half a minute. The anesthesia is rapidly recovered from, and after ill-effects are almost nil. This agent is adapted to cases needing anesthesia for examination, to the incision of abscesses, and for the relief of suffering in labor. It is considered comparatively safe by those who have used it The favorite general anesthetics have been referred to. Space forbids the mention of others less popular and less reliable.

Care of Patient After Anesthesia.—The patient must be carefully watched until he regains complete consciousness. He should, of course, remain recumbent. The erect attitude might result in heart failure. The head should be higher than the body. He should be warmly covered and perhaps be surrounded by hot water bottles. The inhalation of oxygen is best, but an inhalation of vinegar is an excellent procedure to prevent nausea and vomiting. If the latter occurs, the head should be turned well to one side, the vomitus caught in a towel or basin. Food should not be given for several hours and if water is allowed it should be given only in teaspoonful doses quite hot, frequently repeated. If vomiting continues a mustard plaster should be put over the stomach, fresh air admitted to the room and a little hot black coffee given.

Local Anesthetics.—The chief ones are ethyl chloride, ether and rhigolene sprays, ice and salt, carbolic acid, eucaine and cocaine.

Freezing Agents.—These agencies are employed in the lesser operations, and occasionally when there is some complication preventing a general anesthetic.

Ice and Salt.—If one-quarter pound of ice be broken into small bits, and one-eighth pound of common salt added and the mixture be put in a thin bag and laid upon the skin surface, the area will become anesthetic in ten or fifteen minutes.

Ether, Rhigolene and Ethyl Chloride directed upon a part in a fine spray produce anesthesia by their cold effect. The latter is put up in a convenient glass tube with a metal cap. A part touched with pure carbolic acid becomes blanched and anesthetic.

Cocaine Hydrochlorate in a watery solution is quite commonly used for injecting into the skin, for applying to the mucous membrane, the latter absorbing it. It is applied to the nose, mouth or throat by a spray or swab, or dropped into the eye. For injection a two per cent. solution is generally sufficient. For application to the eye a four per cent. solution may be necessary, and for the nose and throat a ten or even twenty per cent. solution may be cautiously used. Da Costa says that never more than two-thirds of a grain should be painted upon a mucous surface and never more than one-third of a grain should be injected into the tissues. Examples of useful purposes to which cocaine may be put are, for instance, the removal of a wen, or a wart, the correction of a small deformity of the bones of the nasal cavity. A finger or toe can be comfortably amputated by its use, a constricting band meanwhile being placed about the root of the part to prevent the absorption of too great a quantity of the drug. The whole area supplied by a large nerve may be anesthetized by injecting cocaine about the nerve trunk.

Eucaine Hydrochlorate.—Eucaine hydrochlorate has practically the same action and may be used in the same way as cocaine.

Infiltration Anesthesia.—Infiltration anesthesia, commonly called Schleich's method, is produced by injecting into a part several ounces of a weak table salt solution to which a minute quantity of cocaine, morphine and carbolic acid has been added. The method is very efficient and has been successfully used for major operations. The anesthesia is partly due to the pressure upon the tissues, especially the nerves, by the injected fluid.

Spinal Anesthesia.—A method lately much talked about and one practiced considerably in France, is one in which a small quantity of a one-half or one per cent. solution of cocaine is injected by a syringe through a hollow needle into the spinal canal. In about five minutes loss of sensibility occurs in the parts supplied by nerves given off below the point of injection. All of the body below the diaphragm can thus be rendered anesthetic. Anesthesia lasts about forty-five minutes. It has been employed successfully in labor and in various grave operations. But it is not without its dangers, and, though relieving pain, it does not remove the horrors of an operation which consciousness must give. This method will probably never supplant general anesthesia. The ideal anesthetic is one without danger which abolishes both consciousness and sensation, thus giving the surgeon the absolute control of his patient—a condition essential to the accomplishment of the best result. May the twentieth century see the discovery of the ideal anesthetic.

SOPORIFICS OR HYPNOTICS.

The Sleep Producers.—The class of remedies so-called are sleep producers. They may be divided into those which not only cause sleep but also relieve pain and those which have no pain-relieving properties. Of the former opium is the best example, and should be given where sleeplessness is due to pain, whereas, if due to other causes opium should never be given.

Insomnia.—Insomnia is such a distressing experience that people will go to extremities to relieve it, sometimes being led to use carelessly the most powerful and harmful remedies. The warning cannot be too emphatic to the laity against such a practice, for this class of drugs should rarely be taken except by the advice and under the direction of a skilled physician. The physician himself should be keenly alive to the especial danger of most direful drug habits. For the treatment of insomnia diligent search should be made for the cause and the latter removed. If due to coffee-drinking at night the habit should be abandoned. If to nervousness because of overwork or excessive social duties proper rest from such strain will probably relieve. If weariness or exhaustion be the cause, moderate stimulation with some hot drink, a little coffee or a small quantity of brandy, will help. A warm bath before retiring is sometimes efficacious. Some quieting occupation before retiring, *e. g.*, the perusal of some light but interesting book will often suffice.

Insomnia from Pain.—However, insomnia from pain must be relieved by opium or some of its derivatives, codeine, morphine or heroine. Long continued administration of opium, except in hopelessly incurable cases, is to be strongly condemned. The cause of pain should be removed, then the need of a hypnotic is gone. In emergency, for the relief of severe pain, there need be no hesitancy in giving to an adult one-fourth to three-fourths of a grain of opium, one-sixth of a grain of morphine, or ten drops of the tincture of opium (laudanum), repeating either dose in an hour if relief is not obtained. Meanwhile a physician should be summoned. When opium is given, it should be with the clear understanding of the probable ill-effects of mental depression, and of nausea and vomiting, and the danger of the habit ever in mind.

Chloral.—Chloral is perhaps the purest soporific. It is poisonous, however, when taken in excessive dosage, causing weakness of the heart or even heart failure. When insomnia is due to nervousness Hare recommends the following:

LATIN.	ENGLISH.
℞.—Chloralis ....1 or 2 drachms	Take of
Potasii bromid ...... 2 "	Chloral ....1 or 2 drachms
Syr. pruni virginiæ. . 1 fluid ounce	Bromide of potassium..... 2 "
Aquæ q. s. ad....... 3 fluid ounces	Syrup of wild cherry...... 1 ounce
M. et S. A dessertspoonful at night.	Water sufficient to make.. 3 fluid ounces
	Mix. Directions: Take a dessertspoonspoonful in water at night.

Sulphonal.—Sulphonal has sleep producing powers perhaps not equal to those of chloral. It finds its chief usefulness in nervous insomnia and especially in that occurring with those of unsound mind. It is commonly given in powder, twenty grains to a dose. As it is insoluble in cold water it should be given in hot water or hot milk. The drug is slow in effect and therefore should be taken two or three hours before retiring.

Trional and Tetronal.—These are closely related to sulphonal and are almost identical with that drug in their action. Their effect is felt in thirty minutes or less. The dose of each is fifteen to thirty grains agreeably given in hot broth or tea.

The Bromides.—The bromides of potassium, of sodium or of ammonium, the three being practically identical in action, are drugs very commonly used as quieters and sleep producers. The former is most frequently used. It is indicated where there is undue excitement of the nervous system, but never where the nervous symptoms are due to depression. It is a useful remedy for hysterical women, for the disagreeable nervous symptoms often accompanying the climacteric, and is a soporific for the over-worked and nervous, provided it is not long continued. It is useful in neuralgias and nervous headaches and frequently quiets the excessive nervousness of drunkenness. The dose of either is ten to thirty grains taken with water in powder, or dissolved in water.

CURATIVE MEDICINE.

PART XV.

POISONS AND THEIR ANTIDOTES.

How Poisons Enter the System.—Under the head of poisons, it is intended to include all those substances which exercise pernicious, as distinguished from medicinal, effects upon the human body, tending to disturb its action or organization injuriously, and if not remedied to possibly cause death. Such substances may be swallowed, or taken in by the breath, absorbed through the skin, or the thinner and more delicate mucous membranes, or implanted by bites, stings, or other punctured wounds.

Symptoms of Poison.—In many cases persons are aware almost immediately after the act that they have swallowed a poison; but in many others, also, no suspicion is entertained at first. In a general way, it may be stated that it is reasonable to surmise a person has swallowed some poisonous substance, if, shortly after taking food or drink, he is seized with violent pain in the stomach, with vomiting and purging, especially if convulsions or paralysis are present, or if the individual suffer from marked giddiness or delirium, or should there be a great tendency to sleep. The first thing to do is to send for the nearest reputable physician, and any neglect of this involves a heavy responsibility if the illness prove mortal, as it is certainly very possible that it will do.

Never Lose a Moment.—In the meantime not a moment should be lost. There are three rules which should always guide an effort to remedy the effects of poison, no matter what it may be: First, to get rid of the poison; second, to stop its effects; and, third, to remedy the evil it has done. In carrying out the principles thus inculcated, whatever is readiest is best; for the poorest remedy given at the moment, is better than the most appropriate, administered an hour later.

Effect of Some Poisons.—A considerable number of poisons are what might be called self-evacuating; that is, having been swallowed, they set up vomiting and purging, and are thereby eliminated. In such cases, all that is needful is to aid the self-evacuating process, especially to assist the vomiting, and so, perhaps, get rid of the poison altogether. If vomiting, however, has not occurred, or has not been profuse, the first thing is to bring it on immediately.

The Mustard Emetic.—The three handy emetics are, usually, mustard, common or kitchen salt, and lukewarm water. If we have a choice, mustard should be used in poisoning where the noxious substance has had a sedative influence, and it is less applicable to those cases where an irritant effect has been produced.

Mustard Dose.—The dose of mustard is a tablespoonful, stirred up in a pint of warm, not hot, water, and, after drinking it, the patient should swallow as much warm water as his stomach will hold, both to dilute the poison and to promote the action of the mustard. After a few minutes, if no signs of vomiting appear, the back of the throat ought to be tickled with a feather, or roll of paper, which will often hasten the emetic effect. When the stomach has emptied itself, it is well to repeat the process, so as to give it a good washing out.

Salt Water Dose.—Should there be no mustard at hand, salt water, mixed in the proportion of a small handful to a pint of lukewarm fluid, and followed by copious draughts of the warm fluid, as before suggested, and tickling the throat if needful, will generally answer the purpose. It is a good plan to send at once to the nearest drug store for some wine of ipecacuanha, to be administered in tablespoonful doses every ten minutes, should the ordinary home remedies fail in their customary energetic effect.

Need of an Antidote.—In some instances, this treatment is all that is required, but frequently the simple plan of getting rid of the poison will not suffice. Its effects must be neutralized or remedied, or, in other words, some antidote is needed. No one antidote is suited to all emergencies. The antidote is required to be adapted to the poison, and therefore an effort should be made, instantly after the emetic is given, to find out what kind of a noxious substance has been swallowed, and the proper remedy should be administered in accordance with the following suggestions.

Object of an Antidote.—The object of most antidotes is to render the active poison an inert substance, after which treatment may be instituted with a view to remedy the mischief which it has previously done. Antidotes, therefore, are generally chemical agents, which attack or combine with the poison in such a way as to render it insoluble, and so inert. But some are medicines, the virtues of which are apparently opposed to the active qualities of the poison, constituting what may be correctly called counter-poisons.

Milk and Eggs.—If we are totally ignorant of the kind of poison which has been swallowed, as may occasionally happen, the treatment

Alphabetical Table of Principal Poisons With Antidotes For Immediate Use.

A case of poisoning is the mightiest of emergencies—one of life or death. Every minute counts. One must know what to fly to on the instant. Here the poisons are arranged alphabetically so as to be found in a second, and followed by their quickest and most effective antidotes at hand in the home.

POISONS. ANTIDOTES.

ABSINTHE.—Give an active emetic; then flaxseed tea freely; stimulate.

ACETATE OF LEAD.—Same as SUGAR OF LEAD.

ACETIC ACID.—Same as CITRIC ACID.

ALCOHOL.—Treat by emetics, hartshorn and external warmth. See page 1339.

ALKALI, VOLATILE.—Drink freely of water with vinegar or lemon juice in it.

AMMONIA.—Lemon juice, diluted vinegar or acetic acid.

ANTIMONIAL WINE.—Give warm water freely to encourage vomiting.

ANTIMONY.—Same as TARTAR EMETIC.

AQUA FORTIS.—Magnesia or soap dissolved in water, every two minutes.

ARSENIC.—Give prompt emetic of mustard and salt—tablespoonful of each. Follow with sweet oil, butter or milk.

BED BUG POISON.—Give milk or white of eggs in large quantities.

BELLADONNA.—Active emetic; stimulate.

BITTER ALMONDS—Same as PEACH KERNELS.

BLUE VITRIOL.—Same as SULPHURIC ACID.

CANTHARIDES.—Evacuate stomach; give mild drinks.

CARBOLIC ACID.—Give flour and water, or other glutinous drinks.

CARBONATE OF SODA.—Prompt emetic; soap or mucilaginous drinks.

CAUSTIC POTASH.—Drink freely of water with vinegar or lemon juice in it.

CAUSTIC SODA.—Drink freely of water with vinegar or lemon juice in it.

CHEESE.—Same as MILK.

POISONS. ANTIDOTES.

CHLORAL HYDRATE.—Cold water on head and face; artificial respiration; galvanic battery.

CHLORIDE OF LIME.—Give acids; evacuate bowels; stimulate.

CHLOROFORM.—Emetic of tablespoonful of mustard in warm water. Follow with stimulating treatment.

CITRIC ACID.—Chalk or magnesia water; flaxseed tea; lime water.

COAL GAS.—See GAS.

COBALT.—Prompt emetic; soap or mucilaginous drinks.

COPPERAS.—Prompt emetic; soap or mucilaginous drinks.

CORROSIVE SUBLIMATE.—Milk or white of eggs, freely.

CREOSOTE.—Starch or flour mixed with water; or white of eggs and milk; or evacuate stomach with an emetic.

DIGITALIS.—Evacuate; lie prone; stimulate.

ERGOT.—Evacuate; give purgatives; stimulate.

ETHER.—See CHLOROFORM.

FISH.—Emetic, followed by saline purgatives and alkaline drinks; or promptly evacuate stomach and bowels, and then stimulate.

FOWLER'S SOLUTION.—Prompt emetic of mustard and salt—tablespoonful of each. Follow with sweet oil, butter or milk.

GAS.—Remove patient to air, use artificial respiration, apply heat to extremities; send for doctor.

HAIR OF CATERPILLAR.—Apply cloths saturated with camphor. Don't rub.

HONEY, POISONOUS.—Black coffee, smell of camphor, and rub with same.

ICE CREAM.—Same as MILK.

IODINE.—Starch, flour, or arrowroot, mixed with water.

NOTE—In most cases of poisoning vomiting should be excited at once. The common emetics are mustard, a tablespoonful to a pint of warm water; salt, a small handful to a pint of warm water; warm water itself, in copious draughts. Salt and mustard mixed, a tablespoonful of each to a pint of warm water, make a quick and powerful emetic. Should an emetic prove tardy, tickling the throat with a feather will help to promote vomiting.

POISONS. ANTIDOTES.

IVY, POISON.—Same as SUMACH. See page 1394.

JIMSON WEED.—Prompt emetic of mustard and salt—tablespoonful of each to pint of warm water, then stimulate with coffee or brandy.

LAUDANUM.—Strong coffee, followed by ground mustard or grease in warm water to produce vomiting; keep in motion.

LEAD WATER.—Milk or white of eggs in large quantities.

LEAD, WHITE, RED, LITHARGE.—Prompt mustard or salt emetic, then castor oil; heat to bowels.

LIME.—Vinegar or lemon juice, then starch water.

LUNAR CAUSTIC.—A strong brine of salt; then milk and sweet or castor oil.

LYE.—Give vinegar or oil.

MAD-DOG BITE.—Tie band tightly around limb above wound; cut out and cauterize wound; apply antiseptic dressing; give purgative and warm drinks; send to Pasteur Institute.

MATCHES.—See PHOSPHORUS.

MEATS, PUTREFIED.—Emetic, followed with vinegar or lemon juice.

MERCURY.—White of eggs freely; afterwards evacuate; mild drinks.

MILK.—Cleanse stomach and bowels; apply heat; stimulate.

MORPHINE.—Strong coffee, followed by ground mustard or grease in warm water to produce vomiting; keep in motion.

MURIATIC ACID.—Magnesia or soap dissolved in water, every two minutes.

MUSHROOMS.—Same as TOADSTOOLS.

NICOTINE.—Same as TOBACCO.

NIGHTSHADE.—Same as BELLADONNA.

NITRATE OF SILVER.—Give common salt in water, freely.

NITRE.—An emetic, then drinks of barley water, followed with castor oil.

NITRIC ACID.—Same as AQUA FORTIS.

NUX VOMICA.—Same as STRYCHNIA.

OAK, POISON.—Same as SUMACH. See page 1394.

OIL OF VITRIOL.—Same as SULPHURIC ACID.

OPIUM.—Same as LAUDANUM.

OXALIC ACID.—Magnesia or soap dissolved in water, every two minutes.

PARIS GREEN.—Same as ARSENIC.

PEACH KERNELS.—Spirits of hartshorn, strong coffee; cold applications.

PHOSPHORUS.—Excite vomiting, then give milk and magnesia, followed by tea of flaxseed or slippery elm.

PINK ROOT.—Coffee without milk, smell of camphor.

POISONS. ANTIDOTES.

POKE ROOT AND BERRY.—Evacuate stomach and bowels; stimulate.

POTASH.—See CAUSTIC POTASH.

POTASSA, BICARBONATE.—Magnesia or soap dissolved in water, every two minutes.

PRUSSIC ACID.—Coffee in plenty and quickly; smell spirits of ammonia, camphor or vinegar, pour water on head and back. Death generally ensues so quickly that there is no time for emetics.

RAT PASTE.—Quick emetic of salt and mustard, then flaxseed tea freely.

RED PRECIPITATE.—Milk or white of eggs in large quantities.

SALTPETRE—Milk or white of eggs in large quantities.

SNAKE BITES, POISON.—Tie band around limb above bite; suck out venom with mouth; cauterize wound; give strong stimulants.

SODA.—See CAUSTIC SODA.

SPANISH FLY.—Same as CANTHARIDES.

STINGS.—Apply salt water, or sweet oil, or fresh mould. Always take out the sting of a bee.

STRYCHNIA.—Emetic of mustard in warm water.

SUGAR OF LEAD.—Milk or white of eggs in large quantities.

SULPHATE OR CHLORIDE OF ZINC.—Solution of soda, milk, white of eggs.

SULPHURIC ACID.—Prompt use of magnesia, soap, chalk or lime water. Afterwards mucilage water or milk.

SUMACH.—Apply to parts a paste of equal parts of starch and gylcerine. See page 1394.

TANSY.—Evacuate stomach; stimulate; artificial respiration.

TARTAR EMETIC.—Drink warm water freely to encourage vomiting.

TARTARIC ACID.—Soap water, lime water, magnesia or chalk.

TIN.—White of eggs and milk, or sugar water.

TOADSTOOLS.—Evacuate stomach and bowels; give Epsom salts; stimulate.

TOBACCO.—Encourage vomiting with salt and mustard water, then stimulate with spirits of ammonia or whiskey and water.

TURPENTINE.—Fresh air, flaxseed or slippery elm tea.

VERDIGRIS.—Same as COPPERAS.

VERMILION.—Milk or white of eggs in large quantities.

WHITE PRECIPITATE.—Prompt emetic of mustard and salt—tablespoonful of each. Follow with sweet oil, butter or milk.

WHITE VITRIOL.—Same as SULPHATE OF ZINC.

is first to provoke vomiting, as already advised, and after the stomach is completely emptied, to give a moderate quantity of some bland liquid, such as milk, eggs beaten up with milk, or sweet oil.

Wine and Brandy.—If the patient feels cold, and the skin is cool and clammy, a little wine or brandy well diluted may be administered; and if he seems drowsy, narcotic poisoning is to be suspected, so that strong coffee, and belladonna under the direction of a physician, should be employed.

Hot Water and Mustard.—If the prostration is very great, stimulants freely, heat to the skin by hot-water bags or bottles, and mustard plasters to the abdomen, are to be resorted to.

When the poison taken into the stomach is known, and prompt attempts have been made to eject it by vomiting, then administer its antidote.

Elimination by Vomiting.—Theoretically the administration of the chemical antidote is the only requisite, the vomiting, with its accompanying discomfort and depression, being uncalled for; but it is safer to eliminate the poison or what part of it can be removed by vomiting, and so take as few chances as possible upon the quality and efficacy of the drug used as an antidote. Chemical results obtained in the laboratory are not always confirmed when the same combinations are attempted within the human system.

Classification of Poisons.—To facilitate the study of the subject some system of management should be adopted. No classifications of poisons is entirely satisfactory, and the following is offered as probably as good as any other for public use:

1. Gases and volatile substances.
2. Metals.
3. Minerals and metallic salts.
4. Corrosive poisons, acids and alkalies.
5. Vegetable poisons, in form of drugs.
6. Vegetable poisons in natural state.
7. Bacterial and food poisons.
8. Animal secretions.

GASES AND VOLATILE SUBSTANCES.

Illuminating Gas.—In the process of manufacture of illuminating gas from coal but little, if any, injury is done the workmen, owing to the distillation of its more deadly constituents in retorts.

In its distribution its escape from imperfect pipe connections and collection in trenches, sewers and houses occasionally causes poisonings and explosions. Illuminating gas known as water-gas is much more deadly and much more dangerous on account of its presence being less easily detected by smell.

On animal organism both forms act as a narcotic and depressant of the nervous system; uniting with that portion of the blood normally taking up the oxygen and displacing the oxygen.

Symptoms.—These depends upon amount of poison absorbed. When poisoning occurs gradually there is discomfort, sense of fullness of blood-vessels, headache, dizziness, hot skin, weakness. There may be nausea, vomiting and convulsions. Coma occurs, which, in some cases of recovery, may last for days; it may precede death but a few hours, or it may continue for days before a fatal termination takes place.

Treatment.—Removal of the patient to the open air; the use of artificial respiration, and the application of heat to the extremities are about all that can be done before the arrival of a physican. Artificial respiration hastens the expulsion of the poison and its substitution by oxygen. This result may be effected more promptly by inhalation of commercial oxygen. Nitro-glycerine and amyl nitrite might be used with advantage.

Aniline.—This is made from coal tar, a biproduct in the manufacture of illuminating gas. It is an oily, colorless liquid, but its poisonous effects are chiefly caused by its volatility. The vapor produces headache, dizziness, marked depression, nausea, vomiting. Delirium and convulsions may occur.

Treatment should be same as for illuminating gas poisoning.

Bromine.—This in its commercial form is a red fluid, but to the fumes arising from it when pouring, etc., is to be ascribed nearly all cases of bromine poisoning. Bromine vapor causes irritation of the respiratory organs, cough, spasm of the opening into the larynx and suffocation. It also causes increased flow of tears and saliva and bronchial asthma.

Treatment.—Inhalation of aqueous vapor.

Carbon Bisulphide.—This is a colorless volatile liquid that causes poisoning chiefly by the vapor arising from it. It is used very largely in the manufacture of rubber goods; has a very offensive odor. Acute cases of poisoning do not occur, except where the substance is used for suicidal purposes, when the symptoms are pallor, vomiting, depression, deep, heavy breathing, characteristic odor of breath, feces and urine.

Carbon Dioxide.—This is the poisonous gas sometimes met with in wells, cisterns, etc. It is the "after damp" of the coal mines. Its deleterious effects and treatment are similar to those of illuminating gas. It will not support flame.

Chlorine.—This is a gas of peculiar odor; is used chiefly as a bleaching agent. The public is familiar with it as a disinfectant in the form of chloride of lime, made by allowing pure slaked lime to take up all the chlorine gas it will absorb. It is a strong irritant to the respiratory tract. Continued exposure to it produces skin eruptions, inflamed eyes, asthma and bronchitis.

Chloroform.—This has been taken as a liquid by accident and intention. In this form its poisonous effects do not occur so soon as when the vapor alone is absorbed.

One teaspoonful has been known to have brought death to a boy of four years. Twelve times this amount killed an adult. Several adults have recovered after swallowing sixteen teaspoonfuls.

Treatment.—1. Empty the stomach by giving a tablespoonful of wine of ipecac, or a tablespoonful of mustard in warm water. Twenty grains of sulphur of zinc or thirty grains of powdered ipecac may be given in warm water for the same purpose. A hypodermic injection of one-tenth grain of hydrochlorate of apomorphine and use of the stomach tube are very effective measures to remove the poison from the stomach.

2. Stimulating treatment must be used extensively, as, for instance, brisk switching, or towel slapping or flicking; hot external applications; injection of hot strong coffee into the rectum, pint at a time; application of mustard plaster to calves and legs and over the heart; hypodermic injections of ether and hot brandy, atropine, strychnia and digitalis; use of the interrupted current by sweeping poles over the surface of the body; placing victim with his head lower than his body that the brain might be supplied with blood with the least possible effort of the heart.

Even though apparently there is no response to treatment efforts at resuscitation should be continued for a comparatively long time, as recoveries have occurred at the end of an hour of continuous effort.

Chloroform.—Chloroform taken into the lungs in form of vapor is supposed to act more promptly than when taken into the stomach as a liquid. In this form there is a wider range between the smallest quantity producing death and the largest amount taken without fatal result. Records show that less than half a teaspoonful mixed with air and administered by a competent person for surgical purposes has caused death, on the other hand a woman suffering with convulsions following childbirth (post-partum eclampsia) has been kept under the influence of chloroform vapor for seventy hours continuously.

Symptoms.—The symptoms of poisoning by inhalation of the vapor are similar to those following taking the drug in liquid form into the stomach.

Treatment.—1. The treatment differs only in refraining from any attempts at the production of vomiting or emptying the stomach by use of stomach pump. Equally applicable to both forms of poisoning are the following aids to resuscitation, not previously mentioned: Prompt commencement of artificial respiration. The occasional inhalation of amyl nitrite. The measure advocated in the following quotation might be of some avail.

2. "When the patient seems to be in extremis a couple or more violent blows on the chest quickly given may restore the action of the heart."

3. **Electric Treatment.**—Regarding the use of the interrupting current as an aid to recovery authorities differ in details of application. One advocates placing one pole of the battery at the pit of the stomach and the other at the region of the larynx, with the idea of stimulating the phrenic nerve, which causes the diaphragm to act and aid respiration. Another authority states this method is dangerous, because nerves (cardiac inhibitory nerves) which tend to slow or stop the action of the heart lie so near the phrenic nerve that it is impossible to stimulate the latter without exciting the former to action, and so defeating instead of promoting recovery; hence the previously mentioned method of sweepnig the poles of the battery over the surface of the body.

Chronic Chloroform Poisoning.—Chronic chloroform poisoning is a condition the existence of which would not be readily suspected. It occurs among a class of people who use chloroform constantly, for the same purposes or reasons that the other type of inebriate uses alcohol. Although the path to ruin and death is probably more direct by the chloroform than the alcohol method, yet that the former is occasionally comparatively long is shown by the record of a woman dying at the age of forty-two in a chloroform stupor, who for at least ten years had taken by inhalation a pint of chloroform daily.

Ether is a colorless volatile liquid. It is highly inflammable, and when taken by the mouth imparts a burning taste. It is not so dangerous a drug as chloroform when used by inhalation and probably not when taken in liquid form. Although less apt to cause death it has greater tendency to produce diseases of the respiratory tract than chloroform when taken by inhalation.

Symptoms of Ether Poisoning.—The symptoms and treatment of poisoning by ether are similar to those of chloroform, except the use of ether hypodermically as a stimulant should not be permitted.

When in poisoning by ether the face becomes cyanotic, flushed, the failure to breathe properly is not due to weakness of the heart but to respiratory trouble, and the head should not be placed lower than the body. When the poisonous effects are carried beyond the cyanotic stage pallor succeeds the same as in chloroform poisoning and indicates lowering the head below the body in the same way as the latter drug.

Treatment.—Traction upon the tongue, simulating normal respiration in frequency, duration, regularity and evenness is a method of causing recovery that is equally applicable to both ether and chloroform poisoning.

Amyl Nitrite.—This is a product of the chemical combination of amylic alcohol and nitric and nitrous acids. It is a clear volatile liquid having an aromatic penetrating odor. For administration by the public it is prepared in small glass receptacles called pearls, resembling some forms of capsules, and containing from three to five drops. The pearl is broken in a handkerchief and the contents inhaled.

Symptoms of Amyl Poisoning.—An excessive amount causes alarming prostration, very rapid and tumultuous beating of the heart, difficult respiration, bursting sensation in the head and roaring in the ears. Recovery is said to have occurred after taking one-third of an ounce. With the exception of prussic acid amyl nitrate is the quickest of all nervous depressants.

Treatment.—Artificial respiration. Hypodermic injection of strychnia and atropine. Give digitalis and whiskey. Apply heat in form of hot water in bottles or rubber bags if required.

Ammonia.—See Corrosive Poisons.

Nitro-benzine.—This is a yellow liquid formed in the manufacture of anilene by adding nitric acid to benzine. It has the odor of bitter almonds and has been used to perfume soaps. It is a subtle, dangerous poison both as a liquid and vapor.

Symptoms.—Inhalation of a poisonous amount is followed by appearances of slow intoxication except the mind remains clear until a period of insensibility is reached. Insensibility may occur with great suddenness, may be delayed for several hours and may continue for several hours before death occurs.

There is an odor of bitter almonds upon the breath.

Treatment.—If the liquid has been taken empty the stomach with a pump or by emetics. If the poison has been inhaled, or taken into the stomach apply heat. Use strychnia and general stimulating treatment.

Turpentine and white lead instead of white lead and oil are largely used for painting interiors, and so forth. It is claimed by the painter and the physician, and denied by the employer, that the use of turpentine in confined places, such as between decks, causes watery discharges from the nose, a feeling of fullness or stuffiness in the head, difficult urination and bloody urine.

Treatment.—Recovery follows exposure to the fresh air and use of mild bland drinks such as tea made from slippery elm or flaxseed. There is no record of the occurrence of any fatalities. Taken into the stomach in excessive amounts turpentine produces the same symptoms of strangury and bloody urine caused by inhalation of its vapors. In addition it may cause inflammation of the kidneys, stomach and intestines.

Iodine in its process of manufacture and manipulation volatilizes at ordinary temperature. In its liberation from seaweed it gives off fumes in the same way as chlorine and bromine in their process of extraction. Its vapors cause the same effects as those of chlorine and bromine. For poisoning resulting from its use in drug form, see Minerals, Metallic Salts.

Prussic Acid.—This colorless, transparent, inflammable, volatile liquid is perhaps the most rapid and deadly of poisons. Taken in sufficient quantity it has been claimed to have caused almost instant death.

Symptoms.—These vary with the quantity of poison taken. When not sufficient to be promptly fatal there may be open, staring eyes, fixed jaws, pallor of cyanosis, depending upon whether the cardiac or respiratory functions are the more affected, convulsions, vomiting, unconscious discharge of feces, urine and semen. The odor of bitter almonds is noticeable upon the breath and upon post-mortem examination, but rapidly disappears.

Treatment.—This is, of course, confined to those cases that afford time for action and may be outlined as use of stomach pumps, artificial respiration, oxygen inhalation, cold applications to head and spine, electricity, ammonia by inhalation or intravenously.

Sulphurous Acid.—This is a strong solution of sulphurous oxide gas. Its poisonous effects are directed chiefly against the respiratory tract.

Remedies.—The remedies are fresh air, artificial respiration and stimulants.

Nitrous Oxide.—This is known also as nitrogen monoxide, and laughing gas is used chiefly as a brief anesthetic in dentistry. It is capable of producing alarming symptoms and even death by respiratory paralysis.

Recovery is to be attempted by fresh air, rhythmic traction upon the tongue, artificial respiration.

METALS, MINERALS, METALLIC SALTS.

Antimony.—This is found both as a metal and a mineral. The preparations of the metal best known to the public, and from the abuse of which poisoning is liable to occur, are tartar emetic, oxide of antimony, sulphureted antimony, wine of antimony and compound syrup of squills, known as Coxe's lime syrup.

Symptoms of Poisoning.—Marked depression characterizes poisoning by this substance. Violent purging and vomiting occur. The bowel discharges are characteristic and known as rice water stools; that is upon standing in a glass a separation can be noticed into two layers; an upper watery and clear, and a lower white and flocculent.

Treatment.—Evacuate the stomach by means of a stomach pump. Give tannic acid freely to form the insoluble and inactive tannate of antimony. The general precautions taken in all cases of depression are to be observed. Maintain the prone position, not raising the head to vomit, nor the body for defecation. Apply heat and use stimulating treatment, whiskey, strychnia and digitalis hypodermically. Give opium to allay pain, but counteracting its tendency to after depression by strychnia.

Arsenic.—This is a brittle crystalline metal of steel-gray color. Its freshly broken surface is very brilliant. It is found in its native state in the rocks of many different localities. It is also a constituent of cobalt, copper, nickel and tin ores.

Symptoms of Poisoning.—Rarely the course is one of rapid succession of severe pain, prostration and death. Frequently the period between ingestion and fatal ending is of five or six days' duration, including a time when there is an absence of marked symptoms and an apparent beginning of recovery. There is a burning sensation in the mouth and esophagus. The stomach and bowels are strongly irritated. There is violent purging and vomiting with great pain over the entire abdominal region. The pain is of cramp-like character, and sometimes extends to the calves of the legs or legs in general. The bowel evacuations are bloody "rice water" in character, and contain stringy mucus, supposed to be mucous membrane stripped from the bowels.

Treatment.—The acknowledged effective preparation to counteract arsenic when taken into the stomach is hydrated oxide of iron with magnesia, and is made as follows: Solution of tersulphate of iron, one thousand parts; magnesia, one hundred and fifty parts; water, a sufficient quantity. Mix the solution of tersulphate of iron with twice its weight of water, and keep the mixture in a well-stoppered bottle. Rub the magnesia and water to thin and smooth mixture; transfer this to a bottle capable of holding thirty-two fluid ounces, and fill it up with water. When the preparation is wanted for use mix the two liquids by adding the magnesia mixture gradually to the iron solution, and shake them together until a homogeneous mass results.

The Stomach Pump.—This antidote will not produce the desired result if the arsenic is not in solution, consequently the stomach pump takes a position of primary importance in attempts at recovery. Following the evacuation of the stomach should be the application of external heat and the administration of stimulating drugs; morphia if necessary to quiet pain. Water to flush the entire system.

Calcium.—This is a very abundant element in nature, occurring as limestone, marble, chalk, and so forth. Calcium chloride is perhaps the only drug derivative that might prove dangerous to the public. In excess this drug is a strong gastro-intestinal irritant, and poisonous effects should be treated by vegetable acids and demulcent drinks. Calcium chloride is not chloride of lime. For the latter see Lime.

Chlorine occurs in combination with sodium, potassium, magnesium and calcium. It is in its liberation that it proves itself dangerous to life on account of its poisonous vapor. (See Gases and Volatile Substances.)

Chromium.—The preparations of this mineral, most familiar to the public, are chromic acid, bichromate of potassium and chromate of lead. All the chromium preparations are irritants to the stomach and bowels and can cause death when taken internally. To counteract, use the stomach pump and give demulcent drinks. Administer stimulants under the skin and apply heat. Give lime-water or other weak alkalies if chromic acid has been taken.

Copper.—The salts of copper taken into the stomach in excess are powerful irritants to the stomach and bowels, giving the following symptoms: Copperish taste, intense pain in stomach, vomiting, purging, convulsions. Death may follow.

Treatment.—Give the chemical antidote, yellow prussiate of potassium, mild drinks, such as sweet oil, milk, white of eggs. Soaps and alkalies are said to be antidotal. The stomach should be emptied of the compounds formed either by emesis or stomach pump. Stimulating treatment and opium to relieve pain should be given.

Gold.—The pharmaceutical preparations of gold are decidedly poisonous, the chloride more so than corrosive sublimate, it is claimed. They are corrosive in their action, with symptoms similar to copper and other gastro-intestinal irritant poisons.

Treatment.—For treatment, evacuate stomach; stimulate. Sulphate of iron is said to be a chemical antidote.

Iodine.—This is a non-metallic substance, having a metallic lustre. It volatilizes at a low temperature and gives off a crimson-purple vapor. For poisoning by this drug, see Gases and Volatile Substances.

Iodoform.—This is a yellowish powder, with a strong and objectionable odor. It is used principally in the treatment of surgical wounds, and has caused local and systemic poisoning when so applied.

Symptoms of Poisoning.—Fatal results have been rare, but when occurring the symptoms were local rash, headache, vomiting, delirium, convulsions, coma. The kidneys may be affected and retention of urine or bloody urine occur.

Treatment.—Cause sweating by the hot pack and give diuretics to relieve the kidneys. Bicarbonate of sodium is said to be useful in promoting the elimination of the iodine constituent of the drug. Stimulate.

Iron.—The only salt of iron likely to do harm by its unguarded use by the public is the subsulphate or Monsel's salt, a solution of which known as Monsel's solution is used to stop hemorrhage.

Antidote.—The antidote is common soap. Monsel's solution should be applied and not taken inwardly.

Lead.—Perhaps no other metal has such diversity of uses in the arts and manufactures. It might be more accurate to say no other metal furnishes such an array in number and variety of instances of poisoning. As a rule industrial lead poisoning is a slow, chronic process, and does not call for the prompt attention required by the ingestion of excessive amounts of lead-burdened drugs.

Sugar of Lead.—Acetate of lead, known to the public as sugar of lead, is the preparation of lead most frequently prescribed by medical practitioners.

Symptoms of Poisoning.—Indications of poisoning are pain in the region of the stomach and vomiting of a white, curdy material, resulting from the chemical combination of the hydrochloric acid of the gastric juice with the lead. Inflammation of the stomach occurs sometimes with constipation, sometimes diarrhœa, with black discharges, caused by the formation of sulphide of lead in the bowels.

Treatment.—Epsom and Glauber salts are preferred as chemical antidotes for their effective action chemically and for their purgative influence. Other antidotes are alkaline carbonates, soap and salt. Use stomach pump or emetics to insure evacuation of stomach contents. Apply heat and give stimulants. Use opium to relieve pain.

Lime.—Chloride of lime, used as a disinfectant and germicide, is slaked lime to which has been added 35 per cent. of chlorine. Its poisonous properties depend upon the chlorine gas it contains, for which see Chlorine, under Gases and Volatile Substances. If lime is taken into the stomach it causes great thirst, abdominal pain and constipation.

Antidotes.—To counteract give vegetable acids and demulcent drinks. Evacuate stomach; stimulate.

Mercury.—This is a silvery, white, heavy fluid metal, obtained chiefly from cinnabar, a sulphide of the metal. In the mining of the ore and in the many industrial uses made of the pure metal, its compounds and combinations, chronic poisoning occurs. Acute poisoning is more frequently due to the injudicious use of drugs containing some preparation of the metal.

Symptoms of Poisoning.—In severe cases these are metallic taste, burning sensation in the throat and stomach, vomiting, bloody stools, convulsions, coma.

Antidote.—The antidote is white of egg; additional treatment same as given in case of other corrosive poisons; evacuation; bland drinks; stimulants. Potassium iodide to aid in elimination. Opium to relieve pain.

Paris Green.—Symptoms of poisoning and treatment same as in arsenic.

Phosphorus is a non-metallic element, discovered in 1669 by Brandt, who obtained it from urine. In 1769 it was found in bones, the chief source of supply at present.

Symptoms of Poisoning.—In acute poisoning symptoms do not appear for several hours. Pain in the esophagus, stomach and bowels may be accompanied by purging or constipation. Discharged matters have characteristic odor and luminosity in the dark. The second or third day there may be a cessation of vomiting or of such symptoms for several hours, followed by a jaundice, pain, vomiting, delirium, convulsions, coma.

Antidotes.—Hare suggests peroxide of hydrogen and permanganate of potassium as antidotes. Sulphate of zinc is recommended for the same purpose. To the victim rescued from even acute poisoning is held out the gloomy prospect of an early death through fatty degeneration of vital organs.

Silver.—The salts of this metal that are most apt to cause poisoning are cyanide and nitrate. The cyanide is dangerous on account of its liberation of hydrocyanic acid when strongly heated. The nitrate is frequently used as a caustic, and when taken into the stomach produces marked gastric and intestinal inflammatory symptoms.

Symptoms of Poisoning.—The lips are first white from the caustic action of the drug, then become black. The vomited matter and the discharges from the bowels turn black upon exposure to the air. Convulsions, coma, paralysis, death may follow.

Treatment.—The chemical antidote is common salt. Soap and alkalies are supposed to annul the poisonous tendencies or to prevent the action of the poison upon the mucous membrane of the alimentary canal.

Tartar Emetic.—See Antimony.

Tin.—In the separation of tin from its ores poisoning is a rare occurrence, except from the deleterious substances combined with the tin. Pharmaceutically it is of little or no value, consequently it is not likely to fall into the hands of the public for perverted use. Of the chloride, three-quarters of a grain injected into the veins of a dog caused death. Fifteen grains introduced into the stomach caused vomiting and gastric irritation. Effective treatment would be evacuation, magnesia, mucilaginous drinks.

Zinc.—All the salts of zinc which can be absorbed in excess have a strongly depressing, even paralyzing, action upon the heart and all voluntary muscles, and may cause death by this means. Convulsions, coma and death is the brief statement of another bond of effects following zinc poisoning.

Treatment.—Empty the stomach. Give milk mixed with sugar and white of egg to form insoluble albuminate of zinc. Sodium or potassium carbonate, tannic or gallic acid have also been recommended as antidotes. Overcome depression by stimulants, strychnia, digitalis, and so forth. Apply heat, give morphia for pain.

CORROSIVE POISONS.

Acetic Acid.—Acetic acid of the pharmacopeia is very mildly caustic. Taken internally it may prove very dangerous. Recovery has followed the injection of three ounces, followed by collapse and asphyxia from closure of the glottis. Suffocation was prevented by tracheotomy. Gastroenteritis is liable to result.

Antidotes.—The chemical antidotes are lime-water and soap-water; milk and other bland drinks should be given. The stomach pump should be applied. Heat and stimulating treatment may be required.

Carbolic Acid.—This, in its pure state, is a white substance, appearing as needle-like crystals. It is very deliquescent and, with the addition of 10 per cent. of water or glycerine, becomes liquid; in this form it is usually dispensed.

Symptoms of Poisoning.—In large doses it has produced death in two or three minutes. In smaller doses it causes gastro-enteritis, marked by extreme pallor, cold sweats, stupor, coma, subnormal temperature, dark urine or suppression of renal secretion, very much contracted pupils. The drug has produced poisonous effects by absorption from surgical dressings.

Treatment.—Give soluble sulphates, Epsom or Glauber salts as the chemical antidote. A well-known authority says the lapse of several hours does not counter-indicate the use of the chemical antidotes as they follow the acid into the blood-vessels and tissues to unite with it. The stomach pump, heat, hypodermic stimulation, bland drinks should follow the use of the soluble sulphates. The use of oil as an emollient drink is prohibited owing to the belief that it aids the absorption of carbonic acid.

Hydrochloric Acid is not so destructive in its action as nitric or sulphuric acids. When swallowed the tissues are superficially destroyed, but rarely does deep erosion or perforation occur. It causes great thirst and restlessness, burning skin, agonizing stomach pain. Chemical antidotes are magnesia, soap or any dilute alkali. Supportive treatment may be required.

Nitric Acid.—In industrial occupations the inhalation of the fumes arising from this acid has repeatedly produced death. Its irritative action upon the larynx may cause spasm of the glottis severe enough to end fatally by asphyxia. Taking it into the lungs has been followed by pulmonary edema and death. As a liquid in excess its action upon the alimentary canal is extremely corrosive, and where death does not follow promptly the following symptoms may appear:

Symptoms.—Burning of the mouth, esophagus, stomach and intestines; intense pain, distention of stomach and intestines, frequent erectations, emesis, extremely fetid odor of exhalations and vomit, great thirst, cold extremities, anxiety, collapse. The stain upon the clothing and lips is yellow in color and is resembled by the stains of iodine and bromide. Discolorations made by the latter two drugs can be removed by caustic potash, but nitric acid stains are increased in brightness by the same application.

Treatment.—The treatment is the same as for other corrosive acid poisons, alkaline solutions, magnesia, soap, chalk, oils, demulcent drinks, heat and stimulation. Opium to allay pain. Recovery is rare and usually followed by early demise from destructive effects, such as constriction of esophagus or bowels or loss of function in digestive organs.

Oxalic Acid.—Accidental poisoning has occurred by taking oxalic acid in mistake for epsom salts. The sour taste is very different from the taste of epsom salts.

Symptoms vary with the quantity taken. Taylor says the minimum fatal dose is one drachm. Death has occurred as early as ten minutes after taking the poison in excess. With large amounts the early indications are those of a corrosive poison, pain in esophagus and stomach, retching and bloody vomit. They may be followed by great depression and death without a struggle.

Treatment.—The antidotes are lime-water, magnesia, chalk; plaster from the wall has been suggested in emergency. These should be given promptly to form insoluble oxalates of magnesium or calcium. The oxalates of ammonium and potassium are soluble, poisonous and require the same antidotes as oxalic acid.

Sulphuric Acid.—This is the most corrosive and the most extensively used of mineral poisons, having the same poisonous symptoms as the other strong corrosive acids. The tissue discoloration due to its action is black. Death may be caused by laryngeal obstruction through violent inflammatory effects; by collapse due to perforation of the stomach or by shock due to extensive destruction of tissues. If recovery occurs the injured tissue sloughs off and subsequent contracture or loss of function may cause death later on.

Treatment consists in the prompt use of magnesia, soap, chalk, lime-water as antidotes. After neutralization of the acid give mucilaginous drinks, milk or other bland drinks. The deep and extensive tissue destruction render the use of emetics and stomach pump dangerous. The strong muscular effort accompanying emesis and the manipulation of the pump both tend to result in perforation. Counteraction of depression by heat and hypodermic administrations is, of course, strongly indicated.

Tartaric Acid, more irritant, but less expensive than citric acid, is sometimes used instead of the latter in making a substitute for lemonade. In large quantities it is a gastro-intestinal poison and has caused fatal results.

Antidotes.—Give soap-water, lime-water, magnesia, chalk as antidotes. Use the stomach pump or emetics; administer stimulants; apply heat.

Ammonia.—This is a transparent, colorless gas, having an acrid taste and an exceedingly pungent smell. It is alkaline in reaction. The best publicly-known preparation containing this gas is aqua ammoniæ or water of ammonia, a solution of 10 per cent. by weight of the gas in water. Death has been caused by inhalation of the gas, by ingestion of the liquid and by the muriate and carbonate. Fatal results have followed after the lapse of four minutes through spasm of the glottis. The same ending may occur after comparatively long periods as with other corrosive poisons, causing stricture or prolonged prostration.

Symptoms.—These are pain, burning sensation from mouth to stomach, vomiting of bloody mucus. Cardiac and respiratory efforts are greatly stimulated, but soon equally depressed. Lachrymation, sneezing and cough are marked. Ammonia differs from the other alkalies in affecting the nervous system, while the others are destructive in local effects only.

Treatment.—As an antidote, lemon juice and dilute vinegar or acetic acid may be given. Bland drinks and vigorous efforts to counteract prostration should follow. Opium may be required to allay pain and reduce nervous symptoms.

Soda.—This is the hydrate of sodium, known commonly as caustic soda. When fluid it is moulded and placed upon the market in the shape of small sticks or cylinders not quite as large as an ordinary lead pencil.

Symptoms of Poisoning.—It is corrosive in its action, causing, when taken, pain throughout the alimentary tract and destroying, by softening, all tissues with which it comes in contact. Vomiting occurs. The softened and destroyed tissues slough, sometimes in mass, and inflammatory conditions follow.

Treatment.—Give weak acids, oils, demulcents, and use stimulating treatment.

Potash.—This is the hydrate of potassium, commonly called caustic potash. It is more corrosive than caustic soda. Poisonous symptoms and treatment are the same. (See Soda.)

VEGETABLE POISONS (in form of drugs).

Limited space and the great number of substances included under this heading compel the briefest notice of symptoms and treatment where poisoning has occurred by accident or overdoses.

Acetanilid, a white powder; common constituent of advertised headache powders. Causes cyanosis, prostration, heart failure. Use strong stimulants, external heat.

Acid, Boric, in large amount produces nausea, vomiting, collapse, cardiac failure. Treatment is to evacuate stomach, stimulate.

Acid, Salicylic, in large amount causes deafness, delirium, defective breathing, respiratory failure. Treatment is by strychnia and other stimulants.

Aconite, a dangerous drug; small amount may prove fatal.

Symptoms of Poisoning.—Tingling of mouth and throat becoming general, pallor, anxiety, slow pulse, weak respiration, great muscular weakness, heart failure.

Treatment.—Keep victim on flat of back, with head below body. External heat, hypodermic injections of ether, alcohol, digitalis, strychnia in large doses, atropine, artificial respiration if required.

Alcohol.—Frequent cases of acute alcoholic poisoning occur among children.

Symptoms.—Giddiness, drunken gait and manner, flushed face, may be pale, stupor, coma, sometimes death long after apparent recovery.

Treatment.—Digitalis, strychnia hypodermically, external heat, artificial respiration, prone position, with head lower than body.

Antipyrine.—This causes erythema or other skin disturbances, tingling sensations, depression. Treatment is same as aconite poisoning.

Apomorphine causes prompt and severe vomiting, depression, cardiac failure. Use hypodermic stimulation, external heat as antidotes.

Absinthe causes insensibility, convulsions, involuntary evacuations, possibly death. Evacuate stomach, give demulcent drinks, stimulate.

Aspidium or Male Fern.—Used to destroy tape worm. Overdose might cause gastro-enteritis, collapse, death. Evacuate, stimulate.

Atropine, Belladonna, Hematropine cause flushed face, general redness of skin, great dryness of mouth and throat, dilated pupils, prostration. For treatment insist upon prone position, evacuate stomach if seen early, stimulate, use artificial respiration if necessary.

Bloodroot.—See Sanguinaria.

Camphor.—In large doses produces roaring in the ears, delirium, convulsions, possibly gastro-intestinal symptoms. To treat, evacuate, stimulate.

Cantharides.—Produces vomiting, bloody stools, priapism, strangury, convulsions, coma, respiratory paralysis. For treatment, evacuate, give morphia for pain, bland drinks, stimulate.

Colchicum.—Symptoms of gastro-enteritis, great pain, fatal depression. For treatment, evacuate, give tannic acid, stimulate, morphia for pain.

Conium.—Muscular depression, paralysis of respiratory muscles. Evacuate, give tannic acid, atropine, stimulate.

Digitalis.—Produces headache, slow full pulse becoming irregular; great prominence of the eye-ball, pearly color of sclerotic coat, vomiting. Death is caused probably by cardiac spasm.

Treatment.—Give tannic acid as a chemical and aconite as a physiological antidote. Evacuate, enforce prone position, stimulate. Prone position should be maintained for days after apparent recovery, as death has immediately followed erect posture after digitalis poisoning of a day or two previous.

Elaterin and Elaterium in excess cause gastro-enteritis. Use stomach pump, heat, stimulant, opium.

Ergot.—Enormous doses are required to cause fatal results. Symptoms are tingling sensations, vomiting, muscular spasm, great coldness of the surface. Evacuate, give purgatives, stimulate, enforce prone position.

Fusel Oil causes muscular rigidity, respiratory failure. Evacuate, stimulate, use artificial respiration.

Gamboge causes gastro-enteritis. Evacuate with pump, stimulate, apply heat, give demulcent drinks.

Gelsemium causes great depression, falling or drooping of the eyelids, double vision, respiratory failure. Evacuate, stimulate hypodermically with atropine, strychnine, ether, digitalis, apply heat, use artificial respiration.

Hemlock.—See Conium.

Henbane.—See Hyosciamus.

Hyosciamus causes giddiness, incoherence of speech, loss of power to swallow, partial loss of voice, difficulty in respiration, delirium. For treatment, evacuate, stimulate.

Jaborandi.—Profuse sweating, salivation, vomiting, diarrhœa, ocular irregularities. Give atropine as antidote, evacuate, stimulate.

Laudanum.—See Opium.

Lobelia causes vomiting, sometimes purging, great depression, respiratory failure. Give tannic acid, stimulate, apply heat, use artificial respiration.

Morphine.—See Opium.

Nicotine.—See Tobacco.

Nitro-Glycerine causes severe headache, rapid, irregular cardiac action, collapse. Give atropine, digitalis, strychnine. Maintain recumbent position.

Nux Vomica.—See Strychnia.

Opium causes mild excitement or contentment, followed quickly by sleepiness, stupor. Cyanotic face, contracted pupils, gradually decreased frequency of breathing, respiratory failure. For treatment evacuate stomach with pump; give strong coffee by mouth or rectum; use flagellation or the battery to keep patient awake; keeping victim in motion by walking is also useful for the purpose, but may exhaust him. Give hypodermic injection of strychnine; apply heat; use artificial respiration.

Pinkroot.—See Spigelia.

Bloodroot, Sanguinaria, causes salivation, vomiting, purging, convulsions, respiratory failure. For treatment evacuate, stimulate.

Spanish Fly.—See Cantharides.

Spigelia causes dilatation of the pupils, prominence or protrusion of the eyeballs, internal strabismus, retching, increasing muscular weakness, depressed respiration, coma, death.

Treatment.—Evacuate; stimulate; use heat and artificial respiration.

Squills produce gastro-enteritis, bloody urine, strangury, convulsions, death.

Treatment.—Evacuate; stimulate; give demulcent drinks.

Strychnine.—Symptoms may begin gradually or be pronounced from beginning. If they come on slowly, there is stiffness of jaw and neck; slight, then strong muscular contractions, with body bent backward and resting on head and feet. Intervals of relaxation succeeded by tonic convulsions; death from exhaustion, or more frequently by asphyxia due to spasm of muscles of respiration.

Treatment.—Give tannic acid. Evacuate stomach, administer bromides and chloral. Amyl nitrite may lessen the spasm. If drugs cannot be given by mouth on account of convulsions, prevent same by chloroform, and at same time give bromides and chloral per rectum. If periods of relaxation are too brief to permit of chloroform securing control, give amyl nitrite hypodermically.

Sulphonal causes sleepiness, stupor, scanty or suppressed urine, unconsciousness, death by respiratory failure. For treatment evacuate, stimulate. Give diuretics; use artificial respiration.

Tansy produces abortive tendencies, convulsion, coma, respiratory failure. For treatment evacuate, stimulate, use artificial respiration.

Tobacco contains an alkaloid, nicotine, that is said to cause death as promptly as hydrocyanic acid. Thirty grains of tobacco or one to two drops of nicotine are sufficient to cause death in less than half hour by the first and in a few minutes by the second.

Symptoms.—Nausea, vomiting, cold clammy skin, general muscular relaxation, pupils contracted, then dilated, odor of person disagreeable.

Treatment.—Recumbent position; tannic acid; evacuation of stomach; stimulants; heat.

Fungi, toadstools, and so forth, may cause vomiting, purging, convulsions, delirium, stupor, death. Evacuate, give Glauber or Epsom salts, stimulate.

Poison Ivy, Poison Oak, Poison Vine cause irritation of skin, particularly of face, itching, swelling, vesicular eruption. If taken inwardly drowsiness, stupor, delirium, convulsive movements.

Treatment.—Externally use alkaline solutions or dilute subacetate of lead. Rest, low diet, laxatives, opium.

Poke Berry and Root causes nausea, vomiting, purging, cardiac and respiratory depression, convulsions. For treatment evacuate, stimulate.

Sumach.—See Poison Ivy, and so forth.

Toxicodendron.—See Poison Ivy, and so forth.

FOOD AND BACTERIAL POISONS.

Cheese.—See Milk.

Cream Puffs.—See Milk.

Custard.—See Milk.

Fish poisoning may be divided into two classes, physiologic and of bacterial origin. As a means of defense and offense some fish secrete deadly poisons, which they eject through spines in caudal, dorsal or ventral fins; others poison with their bite by bathing the teeth in a poison secreted in the roof of the mouth. Fishermen have been poisoned by catching these fish in the hand and by puncture of the feet when wading in the water. The poison is severe and rapid in action, causing great pain in the cardiac region, sense of suffocation, cold perspiration, delirium, convulsions, coma, death.

Symptoms.—The symptoms of fish poisoning in general are similar to cholera morbus; vomiting, purging, cold perspiration, depression, abdominal pain, collapse. The most dangerous cases are those in which free bowel movements do not occur. For this reason opium should not be given to relieve pain, unless accompanied by a purgative to counteract its constipating effects.

Treatment.—The treatment is evacuation of stomach and bowels. Washing the large bowel is the preferred method of cleaning that portion of the intestines. Apply heat and stimulate.

Ice Cream.—See Milk.

Meat.—Disease and putrefactive changes are responsible for poisoning following the use of meat as food. It is said that of 112 epidemics of meat poisoning reported in medical literature since 1867, in which 6,000 persons were affected, 103 were due to meat from diseased animals, and only 5 shown to result from putrefactive changes.

Poison from Cow Meat.—The raw and cooked meat of a cow suffering with profuse diarrhœa for two days before being slaughtered, caused poisoning and death through a bacillus it contained.

Poison from Sausage.—In many cases of sausage poisoning the sausage has been eaten uncooked. While cooking will destroy the bacteria; boiling, drying and freezing do not destroy the ptomaines.

Poison from Canned Meats.—Poisoning from canned meats may be due to diseased meat; to putrefactive changes before canning; putrefactive changes after canning and before opening, owing to imperfect closure of can; to putrefactive changes after opening can.

Treatment.—Symptoms and treatment are similar to those of fish poisoning.

Milk.—In addition to the transmission of tuberculosis and other diseases by milk, the article of food is credited with extensive poisoning in bottle fed babies. It is presumed that the majority of serious and fatal diarrhœas of infants fed upon cow's milk can be traced to bacteria in the milk.

Symptoms.—Bacterial ferments for peptonizing milk are accountable for much of the trouble. The occurrence of these diarrhœas chiefly in summer is explained by the fact that heat aids materially in and is essential to the growth and multiplication of bacteria. Boiling, unless long continued, does not destroy some forms of microörganisms.

Treatment.—Treatment should be abstention from use of milk, washing stomach and bowels, calomel as required.

Milk Products, such as cheese, custard, cream puffs, ice cream, and so forth, have occasioned many serious and fatal results by ptomaine poisoning. The destructive alkaloid that has been discovered in these cases has been tyrotoxicon, though the investigator, Vaughan, chiefly instrumental in its discovery concludes that it is not the most virulent one, nor the one most frequently occurring in milk ptomaine poisoning. In a number of marked cases of poisoning by impure milk products he has been unable to find tyrotixicon, but has also failed to detect the real poison. This tyrotoxicon causes vomiting, purging, epigastric pain, great prostration, death.

Treatment.—This consist in washing stomach and bowels, application of heat, stimulation hypodermically.

Mushrooms.—The close resemblance between some of the poisonous and non-poisonous specimens of mushrooms have led to many fatal cases of poisoning. The two prominent poisons separated from poisonous mushrooms are muscarine, an alkaloid, and phallin, a tox-albumen. The difference in their properties accounts for the difference in symptoms in fatal cases.

Symptoms.—Aside from the variations in symptoms due to quantity of poison ingested and resisting powers of the victim, are the cardiac depression due to muscarine and the choleraic diarrhœa due to phallin. Phallin is supposed to effect blood changes by the serum, is separated and thrown into the bowels causing watery stools and enteritis. Muscarine is the more prompt in production of symptoms and death, indications appearing in three or more hours, while with phallin twelve hours may elapse. Fatal results may with either be delayed for a week.

Treatment.—Atropine given nearly hourly, hypodermically, in doses of one one-hundredth to one-fiftieth is to be used as the physiologic antidote of muscarine. Tannin may also be given as the antidote for alkaloids in general. Muscarine is said to be soluble in acids, so as to prevent rapid absorption mild alkalies should be given. Bland drinks to allay gastro-intestinal irritation are advised. Give cardiac stimulant, alcohol, ammonia, digitalis by hypodermic injection. Intravenous injection of salt solution in condition of collapse is recommended.

Nutmeg produces stupor, and collapse is said to have occurred as a result of taking into the stomach one and one-half nutmegs.

Treatment.—Evacuate bowels and stimulate.

Vegetable Food.—The prominent articles of diet under this head from which poisonous results occur are maize and rye. A ptomaine is produced in maize as a sequence of premature harvesting, improper care of harvested products, and so forth, that is productive of extensive chronic poisoning in Spain and Italy. The dangerous element in rye is a fungous growth called ergot, that in some European countries causes many cases of chronic poisoning. As grave results following the use of both these substances are reached only after somewhat protracted indulgence their treatment requires no further mention.

CURATIVE MEDICINE.

PART XVI.

ART AND SCIENCE OF NURSING.

General Consideration.—There is no room to doubt that faithful, intelligent and efficient care of the sick is often responsible in large measure for recovery from attacks of severe illness and that the ministrations of a well-qualified nurse are second only in importance to skillful medical attendance. In fact there are diseases in which good nursing is more essential to the welfare of the patient than medicines, and in which these would be of little avail, unless accompanied by conscientious services of this character.

The Nurse is Doctor's Assistant.—The nurse is the physician's assistant, and he often depends, in forming his estimate of the condition and needs of his patient, largely upon the observation and judgment of the one who is in constant attendance on the case, who sees the changes which occur at different times of day or night, who notes the effect of this remedy or of that food, and who makes to him reports based upon what transpires during his absence.

What the Doctor Gains.—Thus he often gains valuable suggestions regarding the course and management of the case from what to the inexperienced and untrained might be considered a trivial symptom or a circumstance not worth repeating.

It is not the office of the nurse to discriminate between the important and unimportant features of a case, but to endeavor to give the medical attendant a faithful picture of the case as she has seen it, leaving it for him to weigh the evidence given, to form a just estimate of its value. On his departure the responsibility of the execution of his orders devolves upon her and until his return it is she who assumes the control of the case and gives directions.

THE SCIENCE OF NURSING.

The science of nursing is its theory—the mastery of its technical details—the knowledge of the subject which is acquired by observation.

study and experience. This embraces information on such matters as the care of the patient, including moving, lifting, bathing, dressing, and attending to his wants and comfort; such details as relate particularly to the management of the case, as taking temperature, pulse and respiration, observing symptoms, administering medicines and applying external agents; the preparation and giving of food and drink; the care of the room, attention to the room, including its general cleanliness, order, disinfection, heat and ventilation; and the care of the bed, etc.

THE ART OF NURSING.

The art of nursing on the contrary is its practice—the mode of application of the details learned. For a proper exercise of the art, there should be not merely a knowledge of the science but certain natural physical and mental endowments.

Like the poet, she who would successfully engage in the art of nursing must be born, not made. As in every line of employment, there are in this those who do not possess the requisite qualifications, and it is not infrequently the case that nursing devolves upon friends or relatives of the sick, who assume the duties, not because of any special fitness for the work, but because of sentiment or necessity. A brief consideration will be given to what some of these qualifications are, as a guide to those seeking such information.

QUALIFICATIONS OF THE NURSE.

Disposition.—Lamentable failure will inevitably attend the efforts of any one attempting to nurse, if she has not a suitable disposition. The qualities which constitute an ideal disposition for a nurse unfortunately are rarely all found in any one person. It will nevertheless be useful to consider some of the most important of them.

1. Amiability.—Essentially the product of a benevolent nature, this is a trait of prime importance. A spontaneous flow of kind acts and considerate attentions should characterize the nurse; whereas, irritability of temper and thoughtless and inconsiderate acts are so inexcusable as to at once disqualify her for her work. Therefore, she must naturally be *kind* in thought, word and deed.

2. Sympathy.—Sympathy with a patient's distress, without weak sentimentality is an outgrowth of this attitude of mind, which is of value to the nurse and of benefit to the patient, if not too freely exercised.

3. Cheerfulness.—A bright and sunny disposition not only brings life, hope and cheer into the sick room, and thus aids in the favorable progress of the case, but sheds its influence through the entire household, lightening the burden of trouble from those who are in distress. The sick room is not the place for a gloomy or morose person.

4. Unselfishness.—Disregard for personal comfort and convenience and untiring devotion to the interests of the patient are demanded of the nurse. Hers should be largely a labor of love, in conformity with which, she should be willing to sacrifice herself in behalf of her patient.

5. Calmness.—A nurse with an excitable temperament, who is upset by trivial circumstances, and who cannot even in an extremity exhibit composure, will not tend to tranquilize a patient who is already in a state of nervous irritability. Cool judgment, calm demeanor, and, when not accompanied by hesitancy, deliberate action, will tend to inspire confidence in her intelligence and proficiency, a fact of no little importance in serious illness.

6. Patience.—The trying circumstances incident to the sick room and the exacting requirements of the patient, often call for the exercise of the most unbounded patience. Those who ordinarily are thoughtful and considerate are frequently, when sick, unreasonable in the extreme, and their demands for attentions, which are often unnecessary, become most exasperating.

7. Firmness.—It is desirable for the nurse to be sufficiently resolute to secure compliance with her instructions, but it is not needful to maintain, as is often done, a dogged and uncompromising attitude, and to be inmovable to appeal in non-essentials. Arbitrary refusal in such matters creates antagonism on the part of the patient, which more than counter-balances what has been gained by the nurse and which materially lessens her influence and usefulness.

8. Tact.—Not only in these matters but in her general deportment in the sick room is there opportunity for the exercise of tact. To divert the patient from an undesirable train of thought without making it apparent; to be discrete about the subject of conversation, neither unbosoming all her family affairs nor detailing the histories of all her previous cases; to avoid either depressing, exciting, tiresome or otherwise objectionable topics when reading is permissible; to regulate the matter of visitors without giving offense; in these and in manifold ways are shown the importance of having good, sound common sense, a quality unfortunately far too rare among those who engage in this art.

9. Observation.—The nurse should be a careful observer, able to notice differences in the condition of the patient, and to recognize at least in a measure the meaning of symptoms which she sees. Frequently it is left to her judgment to give more or less of a medicine prescribed, or to change one remedy for another, according to the condition of the patient, and a failure to correctly observe and properly interpret what is seen will work to the detriment of the patient.

10. Physical Soundness.—The strain, physical and nervous, caused by untiring vigilance, loss of sleep, irregular meals, confinement to the sick room, and anxiety, are such as to make essential to the nurse an exceptionally sound, healthy body, endued with the power of endurance. In addition there should be good vision, good hearing and good sense of smell, all of these faculties being called into frequent requisition.

GENERAL CONDUCT IN THE SICK ROOM.

Personal Conduct.—Granted that a nurse has enough qualifications to make her an efficient nurse, there are still some details pertaining to her personal conduct in the sick room, and which are largely under her control, the observance or neglect of which will make the difference, often, between her being acceptable or not to her patients. Some of these are quite essential, while others may appear to be of little consequence, yet to those suffering from severe illness there are no trifles; mole-hills appear as mountains, and the insignificant become matters of great moment, and these very trifles often have much to do with the comfort and peace of mind of the one under the nurse's care.

Reference is had to such matters as dress, personal appearance and habits, movements, manner of speaking, touch, etc.

Clothing.—The outer clothing of the nurse should be of plain, modest color and preferably of wash material, an indispensable requirement in infectious cases. Starched clothing should not be so stiff as to make a constant rustling with every movement. The shoes should be noiseless.

Speech.—The nurse should endeavor to speak distinctly and evenly, though never abruptly nor in loud and rasping tones. Equally objectionable is it to whisper, as this almost invariably is annoying to the patient if he is awake. The voice should be cheerful and reassuring and calculated to inspire with hope and confidence. Very many questions of the patient must be answered adroitly, yet in such a manner as not to convey the impression that attempts are being made to conceal from him what he desires to know.

Touch.—The hands should be always warm, smooth and scrupulously clean and the nails well trimmed. A combination of gentleness and firmness is to be desired in handling and moving the patient, efforts of this sort being steady and deliberate, not sudden and jerking.

Appearance.—General neatness of the hair and person should be strictly regarded. She who is careless of her appearance and tidiness will presumably be equally so of the one under her charge.

Manner.—If nurse is lacking in the ability to make herself acceptable to her patient she is confronted by an insuperable obstacle to success. This will depend almost wholly on her deportment in the sick room. An awkward, boisterous, bustling nurse will not compare favorably with one who quietly and unobtrusively accomplishes her tasks without confusion and noise. Nor, on the other hand, will the nurse who stealthily creeps around on tip-toe be likely to prove acceptable to her patient.

Study of Disposition.—A studious observance of the patient's disposition and a readily ascertainable knowledge of his likes and dislikes will soon enable the nurse to anticipate his wants, to scrupulously avoid that which is likely to annoy and to secure for him that which will give comfort and pleasure or bring repose of body or mind. It is this considerateness for the wishes and feelings of the patient which so often constitutes the difference between success and failure and the lack of which to a sensitive nature is a constant source of irritation and annoyance.

What a Nurse Should Avoid.—A nurse should not forget that a patient's progress toward recovery is retarded by such practices as the following: To rock incessantly in a squeaky chair; to sit and constantly tap with the foot or fingers; to noisily prepare for bed in the room after the patient is ready to sleep; to so time the administration of food and medicine, where this can be avoided, as to disturb the patient just as he has settled comfortably for a nap; to be continually asking whether he would like something done for him; to make unnecessary noise with dishes or papers; to allow the light to shine uncomfortably in his eyes; to hurry him with his meals; to shake his bed, and so forth.

OBSERVATION OF SYMPTOMS.

To intelligently observe the condition of the patient from time to time in order that she may make correct reports to the medical attendant is one of the most important duties of the nurse. Accordingly attention must be given to some of the symptoms which she will be expected to notice.

Temperature.—At stated times during the day, usually morning and night, it will be her duty in the large majority of cases to take and record the bodily temperature. A self-registering thermometer should be used, and after cleansing it the nurse should see that the column of mercury is as low as 96 degrees. If not, the thermometer should be firmly held by its upper end, with the arm raised and extended, and the thermometer swung downward with considerable force, care of course being taken to avoid striking it against anything. This process should be repeated as often as necessary, care being taken not to make the column of mercury go entirely into the bulb, or it will fail to be self-registering. The thermometer is usually held in the mouth, beneath the tongue, or in the armpit, five minutes being required to determine the temperature accurately in the latter place, while three minutes in the mouth is a sufficient time. If the armpit is selected it should be thoroughly dried and the thermometer held firmly in place by the arm being closely drawn to the side; if the mouth be chosen no cold drink should be given for at least ten minutes before and the lips should be kept tightly closed while the thermometer is in place. Care must also be exercised to prevent the thermometer being bitten, especially by children or by those who are at all irrational. With these the mouth had better not be chosen. The temperature normally is about 98½ degrees, although it is usually slightly lowered during the early morning hours and slightly raised in the early evening. In case of depression it may fall one or two degrees; in fever it rarely rises more than about seven degrees, and even at this height the patient is usually in a perilous condition. Between 100 degrees and 103 degrees the fever may be said to be moderate; above 103 degrees high. The gravity of high temperature varies in different diseases; in inflammatory rheumatism and in hysteria for instance the temperature may reach 108 degrees or more and recovery still take place, while a temperature of 105 degrees in inflammation of the bowels would indicate great danger.

The Pulse.—The pulse is usually felt at the wrist, over the radial artery, and coincides with the beating of the heart. If it cannot be distinctly counted at the wrist or over other large arteries, the hand may be placed over the heart. The average pulse rate in the adult is about seventy-two per minute, and in children from about one hundred to one hundred and twenty. In diseases it is occasionally slowed, though usually accelerated, reaching at times one hundred and fifty or more. Its character, which is often quite as important as its frequency, also varies considerably, being at times weak, compressible, irregular, intermittent, wiry, and so forth, or the reverse.

Respiration.—Normally the respiratory movements number about one-fourth the pulse beats. They are apt to be increased in disease, sometimes disproportionately so, the usual ratio between pulse and respiration not being maintained. It is important to observe not only its frequency but whether it is noisy, irregular, difficult, painful or otherwise abnormal.

Cough.—If cough is present it should be noticed at what times it is worse, the frequency, duration and character of the paroxysms. If there is expectoration its features should be observed, its color, whether profuse or scanty, thick, tenaceous, frothy, bloody, and so forth.

Discharges.—The discharges of the patient should be noticed and any departure from the normal reported. The frequency, color, consistence and general characteristics of the movements should be known. The color, odor and quantity of urine, the character of sediments, if any are present, the frequency with which it is voided, and so forth, should be ascertained. In saving a specimen for examination that which has collected during the night is to be preferred. Incontinence of urine, or the inability to retain it; and retention, in which it cannot be voided, sometimes occur. Occasionally in retention the bladder becomes overdistended and the urine dribbles away, this condition simulating incontinence. The use of the catheter will be necessary in this as in the ordinary form of retention.

Miscellaneous Symptoms.—The condition of the tongue, whether it is clean, furred, coated, flabby, indented, and so forth, and whether it is protruded slowly or quickly; the skin, as to moisture, warmth, color and general appearance; the expression, whether wan, pinched, anxious, placid or otherwise; the eye, whether there is swelling of the lids, undue sensitiveness to light, alteration in color, or in the size of the pupils, and so forth; his general attitude and demeanor of the patient; the way he speaks, whether nervous, irritable, restless, rational; the amount and character of sleep; the extent and kind of delirium, if present; the sensations of the patient as described to the nurse; the location and character of pain—whether diminished or aggravated by pressure, whether constant or intermittent, stationary or movable.

HOW TO CARE FOR PATIENTS.

How to Make the Bed.—The mattress should be firm and the sheets large enough to permit them to be well tucked under its edges. The lower sheet may be kept in place more securely by pinning with large safety pins to the mattress. It is often desirable to protect the bed by placing under the patient a folded sheet, beneath which may be a piece of rubber sheeting or enamel cloth. When necessary to remove the "draw sheet," another, folded similarly, may be pinned to it and readily drawn into position as the first is drawn out. In changing the lower sheet with the least disturbance to the patient, the soiled one should be folded alternately backward and forward, something in the manner of the folds of a Japanese folding fan, lengthwise, beginning at the side farthest from the patient, until it reaches him. A clean sheet, folded in the same way, takes its place and can with little difficulty, especially if there is some assistance, be smoothly adjusted under the patient as the soiled one is withdrawn. The upper sheet may be changed by folding it crosswise, tucking it in at the foot of the bed underneath the other clothes and drawing it up into position, the soiled sheet being then drawn down to the foot and removed. Crumbs should be carefully kept from the bed and strict attention paid to having the lower sheet and the clothing underneath the patient absolutely smooth, not only in order to add to his comfort, but that in long continued illness the formation of bed-sores may be prevented.

Bed-Sores.—If the patient is confined to the bed long, the parts subjected to pressure should receive special care by frequent bathing with alcohol. If there are indications of irritation from pressure, especially over the bony prominences, soothing applications such as zinc ointment or vaseline should also be used, or the parts may be protected and the process of repair assisted by applying flexile collodion or a piece of Johnson's Z. O. Mull plaster. It is much more difficult to cure bed-sores than it is to prevent their occurrence.

Changing Clothing.—In changing the clothing, the sleeves should first be removed from the patient. The clean garment is then laid face down on the patient, with the top toward his feet and the sleeves are put on his arms. Then as his head is slightly raised the soiled garment can be slipped over the head and the clean one put on at the same time. If, however, the patient cannot be raised at all, the front of the garment must be ripped. Then as one sleeve is taken off the clean one replaces it, while the garment is gradually tucked under the shoulders and body, when the other sleeve may also be changed. A light wrap should always be at hand to throw around the patient's shoulders when he sits up in bed, for the sick are very susceptible to the change in temperature which occurs in being thus partially uncovered.

Bathing.—In bathing a patient, only a small portion of the surface should be done at a time, and this as much as possible should be done under the covers. A few tablespoonfuls of alcohol put into a small basin of water will not only facilitate the cleansing of the surface but will add to the comfort of the patient and help to reduce the temperature if fever exists. In all these cases the surface of the body should be sponged at frequent intervals.

Bath Temperatures.—Cold baths, at a temperature of 40 degrees to 60 degrees Fahrenheit; tepid baths, from 85 degrees to 95 degrees; warm baths, from 95 degrees to 100 degrees, and hot baths from 100 degrees to 106 degrees are employed for their therapeutic value, under the direction of the physician.

The Wet Pack.—The wet pack consists in wrapping the patient in a sheet wrung out of cold water and covering with warm blankets or comfortables. When, after fifteen minutes to an hour have elapsed, these are removed, the body should be well dried with towels.

Sitz Baths.—Hip or sitz baths, foot baths, etc., are also employed. Russian baths consist in the application of steam to the surface of the body at a temperature of about 95 degrees, which is gradually raised to 110 degrees. In Turkish baths hot air instead of steam is used.

Temperature and Ventilation.—Except in warm weather the temperature of the room should be kept at about 70 degrees. In some diseases of respiration it is advantageous to have the temperature somewhat higher, and in all cases the atmosphere should be charged with moisture. If furnace heat is employed this may be accomplished by hanging in front of the register a cloth which is kept damp. A sick person should be supplied hourly with 2,000 cubic feet of fresh air. In other words he should be in a room twelve feet high and ten feet by sixteen or its equivalent, and the air in this should be renewed hourly. If a nurse also is in the room it should be proportionately larger or more freely ventilated.

Disinfection.—The employment of disinfectants materially aid in keeping the air of the apartment pure. Among the best to employ are preparations containing free chlorine, such as chlorinated lime, commonly known as chloride of lime, solution of chlorinated soda and Platt's Chlorides. These and the equally good preparations known as electrozone may be freely used in open vessels in the room and to place into the utensils used for receiving the discharges.

Disinfection of Clothing.—In disinfecting in infectious diseases, all washable clothing, sheets, and so forth, should be boiled in a covered boiler for a half hour, having been placed at once into the boiler in the room, or submerged in a disinfecting solution. Instead of handkerchiefs pieces of soft linen should be used and burned. All sweepings from the room, should likewise be burned and eating utensils be thoroughly disinfected with a solution of carbolic acid, a tablespoonful to the pint of water, or preferably boiled. After the termination of the illness the room should be subjected to the vapor of formaldehyde gas introduced through the keyhole of the door by means of appliances for the purpose, or what is less certain, to the fumes of burning sulphur.

Sundry Suggestions.—A number of practical hints of a miscellaneous character and which cannot well be classified elsewhere are here given:

1. Where a choice can be made a bright sunny, airy room should be selected in which to nurse the sick. It should be remote from the rest of the house, if possible, so that noise may be excluded.

2. The room should be kept scrupulously clean and neat. Dust should be wiped up carefully from the furniture and the floor wiped with a damp cloth or carefully brushed with a pan and brush in such a way as to avoid raising a dust.

3. The patient should be kept as quiet as possible. It is often desirable to keep from him the knowledge of what is transpiring in the household.

4. In feeding never hurry the patient nor feed in too large mouthfuls. Prepare and serve food daintily, bringing only enough at once to tempt, not to pall the appetite. Liquids may be fed through a bent glass tube, a feeding cup, or preferably a glass with the lower lip elongated and bent at such an angle as to permit it to be tipped without spilling its contents while the patient is recumbent. It is often better to feed in small quantities and frequently than to give a large amount at longer intervals.

5. Visitors are to be admitted sparingly, if at all. Calls should be brief and should not be permitted to weary the patient. It is better to have one caller at a time, followed by a second, than to have both present at once.

6. Care should be taken not to jar the bed by knocking against it.

7. If fanning is desired it should be slow and gentle, not vigorous, and should be with a noiseless fan.

8. The nurse should not eat, dress or undress in the same room as the patient.

9. She should have daily an opportunity for an hour or more to be spent in the fresh air, and should not assume for any length of time both day and night duty.

10. In fevers water may be freely allowed, provided that too large an amount is not taken at one time.

11. Thirst is better relieved by sipping very hot water than by drinking cold water. Pieces of chipped ice are also often very acceptable.

12. For nausea and vomiting sips of very hot water or small pieces

of chipped ice swallowed whole are serviceable. Mustard plasters to the pit of the stomach may also be advantageously employed.

13. Small pieces of ice may be kept longer from melting by putting them into a piece of flannel shaped like a funnel and suspending this by means of a rubber band or piece of twine in a pitcher into which the water drips. Several layers of flannel should cover the top.

14. Chips of ice may readily be broken off by means of a straight pin, especially steel pins with large heads, as mourning pins, bonnet pins, and so forth.

15. Prepare for the reception of a patient seriously injured by having a warm bed with plenty of hot water bottles, and so forth, for applying artificial heat. If there is severe shock keep the head low, stimulate freely and rub the extremities briskly.

16. Attacks of fainting are to be treated by keeping the head low, giving plenty of fresh air, loosening the clothing about the neck and waist, sprinkling water on the face and administering ammonia or smelling salts cautiously by inhalation. When the patient can swallow aromatic spirits of ammonia, a half teaspoonful in water or whiskey, a tablespoonful may be given.

17. Heart failure is to be treated as shock.

18. Sprains, if treated at once by soaking in very hot water, will be relieved to a large extent of the pain and swelling.

19. Bleeding from the nose which cannot be checked by pressure and the application of cold may often be controlled by syringing with salt water. If this is ineffectual the nostril should have inserted into it a pledget of gauze (cheese-cloth) in the meshes of which is tannic acid or powdered alum. Or tannic acid mixed with brown sugar in equal proportions is useful as a local application.

20. Additional covering should always be accessible for use during the early morning hours when the patient's vitality is lowest.

21. Bed-pans should be warmed before using. They may be more readily placed in position if the upper surface is first lubricated with vaseline or oil.

ADMINISTRATION OF REMEDIES.

Internal Remedies.—Liquids, powders and pills and the modifications of the latter, tablets and capsules are the modes by which medicines are administered internally. As much as possible an array of medicines should not be on exhibition in the sick room. Any which in their administration require special care, such as poisons, should be kept in a place by themselves and some means adopted for distinguishing them by the sense of touch, such as a piece of ribbon tied about them.

Pills and Powders.—To give pills, powders, etc., they should be placed as far back on the tongue as possible and a large swallow of water taken. Some powders are quite readily taken by floating them on a teaspoonful of water, others by mixing them into a paste with a few drops of water and placing on the tongue, a drink being taken to wash it down. Medicines in liquid form, unless specific directions to the contrary are given, had usually better be freely diluted. The mere addition of water does not usually diminish the efficacy of a drug, whereas when undiluted remedies are often too strong.

Measuring of Medicines.—Since spoons vary in size and drops differ according to the consistence of the liquid, droppers and graduated medicine glasses are better for measuring liquids. One teaspoonful should equal a drachm, two teaspoonfuls a dessertspoonful, two dessertspoonfuls a tablespoonful, two tablespoonfuls an ounce, two ounces a wineglassful, two wineglassfuls a teacupful, two teacupfuls a coffeecupful, and two coffeecupfuls a pint. In measuring liquids, the glass should be held perfectly even, on a level with the eye and the liquid slowly poured out from the bottle, on the side opposite the label, to prevent soiling the latter by drops rolling down the outside. If the medicine is measured by a spoon, it should be poured into a larger receptacle in order that it may not be spilled while administering it. In dropping from a bottle, the lip should be moistened in one spot with a drop of the liquid, and the side of the cork held against the moistened edge at an angle of about 45 degrees; if the bottle is carefully tilted its contents may be accurately dropped out.

EXTERNAL REMEDIES.

Poultices and Fomentations.—The effect of poultices is to soften and relax the tissues by the application of heat and moisture. In this way pain is relieved in many cases of inflammation, suppuration is prevented unless the process has gone too far, or if it is imminent or present it is hastened, and the healing of wounds and ulcerating surfaces promoted. If too long applied they do injury by lowering the tone of the parts.

Making and Applying Poultices.—Powdered slippery-elm bark, Indian meal or "mush," flaxseed meal, bread, or any similar substance which will retain the heat and moisture well, are employed. Hot water is gradually added to the material selected, until it is thick enough to stick to the wall if thrown against it. It is then spread quickly on a piece of thin material as muslin, to a thickness of about three-quarters of an inch, leaving a margin twice that wide. It is then covered by a similar piece of muslin, or preferably of thinner material, as cheese cloth and the edges turned over to prevent the contents spilling. The thinner side should be applied to the affected surface, over which a little glycerine has previously been rubbed to prevent sticking. The poultice should be covered by a piece of rubber or some water-proof material to aid in retaining the heat and moisture. A hot poultice should be ready to replace the one in use as soon as it begins to cool. If used on the trunk, care should be taken to prevent catching cold by permitting only the briefest possible exposure of the heated part while changing the poultices, and after they are discontinued a thin sheet of cotton or a light flannel cloth should be applied as a protective.

Fomentations.—These are for the same purpose as poultices, but they require more frequent renewal as the heat is not retained as long. A flannel cloth is folded in half, laid on a towel which has two sticks tied to its ends to serve as handles, boiling water is then poured over it and the superfluous moisture expressed by twisting the towel. Or, the flannel, after being folded may be dipped into boiling water, laid between the folds of some thick absorbent material as Turkish toweling, and pressure as by means of a rolling pin applied to express the excessive moisture. It should then be quickly shaken out and applied to the desired surface with some impervious material, and a flannel or cotton layer to aid in retaining the heat and moisture.

Medicated Poultices.—Both poultices and fomentations may be medicated by the addition of antiseptics, laudanum, turpentine, and so forth, and materials having medicinal qualities, such as hops, poppy and digitalis may be used in poultice form for the relief of certain conditions by placing them in a bag, preferably flannel, and dipping into hot water, hot vinegar or hot alcohol.

Spiced Poultices.—Spice poultices or plasters are made in this way for mild counter-irritation in colic, and so forth, equal quantities of ginger, cayenne pepper, cinnamon and cloves being mixed together.

Pepper Plasters.—Pepper plasters are made of cayenne pepper the same way as spice plasters; or flour, pepper and water may be mixed together as an ordinary poultice, or to the white of an egg the pepper may be gradually added until of the proper consistence. The latter plan is said to have the merit of efficacy without causing much irritation and is useful in neuralgic affections.

Mustard Poultices.—These are made by mixing mustard flour with warm (not hot) water, and if desired adding a third or a half of wheat flour. The white of an egg may be advantageously added, or to relieve the burning the surface may be dusted after the poultice is removed, with a cooling powder, such as compound stearate of zinc with boric acid, or with menthol, or a soothing ointment such as cold cream, zinc ointment or vaseline. From fifteen to thirty minutes is a sufficient time to apply mustard poultices, the aim being merely to produce sufficient irritation to thoroughly redden the skin Never should a blister be allowed to form, as the resulting sore is very painful and slow to heal.

Turpentine Fomentations.—These are called stupes, and are made by dipping flannel cloths into boiling water, as above directed, and sprinkling on the surface five or ten drops of turpentine; or in a half basin of hot water a teaspoonful of the turpentine may be placed. They are useful in cases of colic, being efficient in aiding to dispel the gas.

Blisters.—These are generally produced by the application of cantharides or Spanish fly in the form of a plaster or of cantharidal collodion. From two to eight hours usually elapse before the blister is produced, depending in the thinness of the skin, the strength of the plaster, and so forth. The surface selected should be washed and thoroughly dried before applying it. Occasionally it should be examined to see whether the desired effect has been produced; if so the plaster should be carefully removed, and if any of it remains it should be cleaned with a little oil. If after twelve hours no blister has formed the plaster should be removed and the part poulticed, when a blister will usually form. In children, or in parts where the skin is very sensitive. it is well to do this as soon as the skin is well reddened. After the formation of a blister the serous contents are generally permitted to escape by snipping the lowest part with a pair of clean scissors. A dressing of vaseline or zinc ointment may then be applied.

Dry Cups.—These are used to produce counter-irritation. The most convenient form is a set of glasses of different sizes, provided with valves, and from which the air is exhausted after closely applying the cup to the surface of the body by means of a vacuum pump. Several of these may be placed in succession along side of each other. As the vacuum is produced the skin rises in the cup and the blood flows to the part. When it is desired to remove the cup, the skin may be pressed near the cup so as to admit the air beneath.

Cupping with a Tumbler.—In the absence of this cupping apparatus, a less convenient method is to use an ordinary thick glass tumbler; to hold it over a pledget of cotton previously saturated with alcohol and ignited;

after this has burned for a few moments it is quickly removed and extinguished and the glass containing rarified air is clapped on to the surface of the body, accomplishing the same result as described above.

Wet Cups.—These are used for purposes of local blood letting in which, after dry cupping, the part is scarified with superficial incisions; the cups are sometimes replaced in order to promote the flow of blood. It is a practice which belongs, however, more to the domain of surgery than of nursing.

Lotions, Liniments and Ointments.—Lotions are remedies applied to the exterior of the body by simply painting, washing or mopping the surface. If they are intended to evaporate, so as to reduce heat and inflammation, they should be left with as little covering as possible.

Liniments.—These are external applications in which rubbing is employed, and are usually somewhat counter-irritant.

Ointments.—These are fatty substances applied either with or without rubbing.

Dry Heat.—This is used to impart warmth, restore suspended animation, relieve pain, as in cases of neuralgia and muscular rheumatism and in other affections. Appliances are now procurable for use in the home in which the affected part may be treated by air heated to a temperature of several hundred degrees. Hot water bags and bottles, hot stove lids, irons, bricks and plates, bags of salt, sand and ashes are common examples of the modes of applying heat. All these should be properly wrapped to prevent burning the patient. Where bottles or rubber bags are used the stoppers should be carefully fitted to prevent the possibility of leaking; the bag should be seamless lest the heat melt the cement and the patient be scalded, and it should only be half filled in order that it may conform more comfortably to the shape of the body.

Cold.—Cold is applied for the reduction of temperature, for the relief of inflammation and sometimes in the treatment of pain. Muslin cloths laid on ice, constantly renewed, cloths wrung out of ice water and rubber bags partially filled with small pieces of ice are the ordinary means of applying it. Coils of rubber tubing through which ice water is made to flow are also convenient. The same may be used for hot water. Ice bags should have between them and the surface of the skin a thin layer of flannel or other material. If folded in a napkin or other cloth they may be conveniently pinned to the clothing of the patient, or where applied to the head, to the pillow, to keep in position.

Miscellaneous Application of Remedies.—Remedies are also applied to the mucous surfaces by injection, suppositories, douches, inhalation, dusting, and so forth, by absorption through the skin into the general system; and by injection under the skin or into the deeper structures of the body. The utmost care should be observed to have all appliances used for these purposes scrupulously clean to avoid the danger of infection. Of these methods several must be more than mentioned.

Enemata or Rectal Injections.—These are used for the purpose of securing movements from the bowels, to cleanse and medicate the lower part of the intestinal tract and to administer nourishment in cases where the stomach cannot be used. Large injections are sometimes used for their mechanical effect in helping to restore to its normal position an invaginated section of the bowel.

For the relief of constipation a teaspoonful of glycerine injected by means of a small piston syringe, preferably of glass with a soft rubber tip, will often cause a movement in the course of a few minutes, especially when the constipation is due to torpor of the lower portion of the bowel. When it is necessary to use larger quantities of liquid a bulb syringe or fountain syringe should be employed. All air should be expelled from the tube by filling it with water, the nozzle should be lubricated with soap and water, with vaseline or oil, and with the patient lying on the left side with knees bent and the bed amply protected, it should be inserted backward, upward, and to the left without force. After seeing that the orifice of the nozzle is not obstructed by a fold of mucous membrane or by foreign material the liquid should be allowed to slowly flow. If pain is produced the flow should be intermitted and resumed again after a few moments' rest. If haste is used expulsive efforts are likely to be excited and the injection not retained. One to three or more quarts may be used if care is exercised and the enema be retained ten or fifteen minutes. After the nozzle is withdrawn a folded towel may be pressed against the anus for a few minutes to aid in its retention. High injections are sometimes employed with a long tube, but should be administered by the medical attendant. The knee chest position is an aid in these cases.

Material of Injections.—Various materials are used for injection, the basis usually being water, hot, cold or tepid, plain or with the addition of such substances as turpentine, castor oil, soap, epsom salt, glycerine or ox-gall—these, alone or in combination. For the relief of dysentery and diarrhœa injections of about two ounces of thin starch and thirty drops of laudanum repeated every two hours often act satisfactorily in controlling the pain and irritability. In the summer diarrhœa of infants there is often no more useful plan than to thoroughly irrigate the intestinal canal by means of a syringe and a soft catheter, with tepid or cold water, in each pint of which a teaspoonful of salt, and, if desired, some mild antiseptic are dissolved.

Vaginal Douches.—These are administered with the patient on the back, the hips being well elevated. For the relief of congestion of the uterus it is usual to employ at least a gallon of water as hot as can be borne. When all but a quart has been used the remaining portion is often medicated with laudanum, glycerine, salt, alum, chlorate of potash or other remedies. Intra-uterine douches should be administered by the physician or under his immediate supervision.

Suppositories.—These are small masses, usually conical in shape, and composed of cocoa butter or some other material which will melt at the temperature of the body, and medicated. They are used for introduction into the rectum, vagina or uterus, and, except in the case of the last named, readily slip into position if lubricated with a little oil or vaseline.

FEEDING THE SICK.

Selecting Foods.—One of the important matters connected with nursing is the question of nourishment for the patient. While in most cases the physician will give directions in general as to the feeding, it will often devolve on the nurse to make selection for the patient of what she considers suitable, and not infrequently she will find it necessary to prepare the food herself. She must decide what combinations are appropriate, and what variety must be introduced, and when the patient tires of one food she must exercise her ingenuity often to the utmost to find a substitute. Food which is suitable in the morning, or at noon, is often improper to give at night, and what will agree under some circumstances will manifestly, under other conditions, be wholly inadmissible. As a usual thing it is better not to consult the patient about what his meal is to be, for if he is asked what he would like he will in all probability say that he would rather have nothing, and if told beforehand what he is to have, even if he has been wanting it, he will be apt to lose his desire for it.

The Patient Not to Judge.—Moreover a patient's inclinations are often not a safe guide, for he will be as likely as not to choose some article of diet altogether unsuitable. For instance, in convalescence from typhoid fever it is quite essential to exercise the utmost care in the matter of food for a considerable period of time, the ordinary diet being resumed only very gradually and tentatively, lest irritation and consequent relapse occur. But it is almost invariably the case that long before it would be permissible the patient has a strong desire for solid food, often of the kind which would not be proper, and an inordinate appetite, which, to gratify would inevitably be detrimental.

How the Nurse Should Judge.—Accordingly it is better to ascertain quietly and gradually the likes and dislikes of a patient, and what ordinarily agrees with him best, and with this knowledge to use one's judgment as to what to provide.

There are certain articles of diet, however, which are preëminently suitable for the sick, some under one set of circumstances, some under another. Among these are:

Milk.—The bland, unirritating nature of milk and the fact that it furnishes all the elements necessary to sustain life make it ordinarily a suitable article of diet for the sick, and unless contra-indicated it is quite usual to have it form the basis for the construction of a dietary, and for it to enter largely into the composition of the food selected. It is not infrequent indeed that it is used alone for many weeks at a time.

Administration of Milk.—If the taste is objectionable to the patient it may be disguised by flavoring with coffee or caramel. By feeding through a tube or straw the action of the saliva is secured, and by giving it slowly the formation of large curds, impenetrable by the gastric juice, is prevented. To counteract the tendency to biliousness, which occurs in many people from its use, it is customary to add a small pinch of bicarbonate of soda, or from a third to a half of lime water, soda water, apollinaris or vichy. At times it is more easily digested if boiled or scalded and diluted; in diarrhœa boiled milk often has a salutary effect.

Steady Milk Diet.—An exclusive milk diet is often resorted to in cases of heart, kidney and stomach diseases, and under these circumstances it is generally first skimmed. Dr. Thomas G. Morton is accustomed to having it administered every hour and a half from 7 A. M. to 10 P. M., beginning with three ounces or six tablespoonfuls, and increasing the amount one-half ounce with each dose until from two to six quarts are taken daily. This diet is continued for a month or six weeks, when a few easily digested articles are allowed, and a suitable dietary is gradually constructed. On a milk diet the patient at first feels weak, and soon develops a disgust for the milk, but this is usually overcome before a great while, and a desire is often established for a continuance of the milk even after convalescence. It is usually necessary to administer suitable laxatives to overcome the constipation which the milk causes.

Whey.—This is a watery, somewhat turbid, liquid resulting from the removal of the curd of milk after coagulation. It contains a fair proportion of the nutritive constituents of the milk, which may be increased by expressing as much of the fluid from the curd as possible. Sometimes it is used as a vehicle for the administration of other nutriment, as beef juice, yolk of egg, etc. The writer has used it to advantage by adding Mellin's Food in severe gastro-enteritis of children.

Preparation of Whey.—Whey may be prepared in several ways. To a pint of lukewarm whole milk is added a teaspoonful of essence of pepsin, or of liquid rennet, and stirred only long enough to mix. After cooling and coagulation, the product is stirred with a fork, and the whey strained off. Or to a pint of boiling milk add two teaspoonfuls of lemon juice and strain. Wine whey is made by bringing to the boiling point a pint of milk and adding two wineglassfuls of Sherry wine. As it boils up again remove from the fire and strain.

Junket.—Make the same as the first formula for whey, with essence of pepsin or liquid rennet, but do not stir. Eat with sugar and cream. If desired, flavor with a little nutmeg and extract of vanilla. Tablets are furnished in the stores for the sake of convenience for making junket.

Buttermilk.—Fresh buttermilk can be used in many cases where milk disagrees, largely because of the formation of finely subdivided curds.

Koumiss.—For the same reason koumiss is often valuable under similar circumstances. Containing as it does carbonic acid gas it is grateful to the irritable stomach, while the small amount of alcohol present furnishes slight stimulation. To prepare it take an eighth of a cake of Fleishman's compressed yeast—fresh—and a tablespoonful of white sugar. Dissolve in a little warm water. Pour into a quart champagne bottle and fill to the base of the neck with fresh milk. Tie cork securely, lay on its side in a cool but not cold place for two or three days, shaking occasionally. If it is desired to hasten the process of fermentation, it may be kept for twelve hours at a temperature of about 70 degrees, although the slower method makes a smoother and pleasanter preparation. A champagne tap must be used to draw it off. Some prefer it when two days old, others when it is somewhat more acid in taste, at the age of three days. Kefyr and matzoon are similar to it.

Peptonized Milk.—To a pint of lukewarm milk diluted with one-fourth its bulk of water add fifteen grains of bicarbonate of soda and five grains of Fairchild's Extract of Pancreas. Keep in a warm place for twenty minutes. Then place against the ice to check further peptonization. This milk is partially predigested and can often be taken when milk cannot.

Sterilized Milk.—To sterilize milk without a special apparatus for the purpose it should be placed in infants' nursing bottles, which should be lightly corked with absorbent cotton. These should be placed in a kettle of cold water, with their bases kept from the bottom of the kettle by a folded towel or other contrivance. The water should be boiled for twenty minutes, the cotton removed and replaced by tightly-fitting corks and the bottles be allowed to cool gradually. Strictly speaking, milk thus prepared is "Pasteurized," the process of sterilization being simply a prolongation of this, for about twice the length of time. Pasteurized milk is more easily digested than sterilized milk. Both are used for feeding invalids and especially infants.

Modified Milk.—This is a combination of milk, cream, water, lime-water and sugar of milk in such proportions as the age and strength of the infant for which it is prescribed seem to indicate. A useful and convenient way to employ this for home use is by means of the "materna" apparatus, which is a graduated glass presenting eight panels, each one being marked in such a way as to show how much of a particular constituent of the modified milk is to be used for a specified age.

There are also combinations of milk with other articles which will be considered among the miscellaneous formulæ given later on.

Animal Broths.—These often form a suitable means of giving nourishment to the sick. Unless prepared with great care they do not contain the amount of nutrition for which they ordinarily receive credit, for if too high a heat is used the albuminous principles are coagulated and the virtues of the preparation decreased.

Beef Essence.—A piece of lean, juicy beef is minced and placed in a wide-mouthed jar, which is tightly corked and set in a kettle of cold water. This is then allowed to boil moderately for three or four hours, when the essence is expressed and seasoned. A tablespoonful may be given every two hours.

Beef Tea.—Cut in small pieces a pound of lean, juicy beef. Cover with cold water for an hour or more. Simmer gently for three hours at a temperature not above 160 degrees; strain and season. The finished product should measure one pint; if less, sufficient water may be added to equal that amount.

Beef Juice.—Pieces of lean, juicy beef the size of a walnut are toasted for a moment over a hot fire and the juice expressed by means of a lemon squeezer or a specially-designed press. Season with salt and give a tablespoonful every two hours either warm or mixed with pounded ice.

Scraped Beef.—Lean, raw meat is scraped fine and the pulp pressed through a coarse sieve. This may advantageously be added to the beef tea or beef essence.

Mutton Broth.—Add two quarts of cold water to two pounds of lean mutton; boil very gently for two hours and season. A little barley or rice may be added. The broth should be allowed to cool and all the fat skimmed off.

Chicken Broth.—A chicken, or, if large, a half chicken, after being skinned and cut up, is boiled gently in a quart of water for an hour, seasoned and strained through a colander.

In cases where solid nourishment is permissible the following kinds of animal food are suitable:

Beef Steak.—A piece of thick, lean sirloin or tenderloin steak should be broiled quickly over a clear coal fire, the exterior only being cooked, while the interior is kept rare and juicy.

Lamb Chops.—Lean rib or loin chops are suitable. They should be broiled until well done.

Chicken.—Tender chicken, carefully broiled, is a suitable food for the sick.

Squab.—Young pigeon or squab, broiled, is considered a delicacy and is nutritious and appetizing.

Sweet Breads.—In some cases these may be eaten and are highly appreciated. They should be parboiled and then carefully broiled, with a little butter rubbed over the surface.

Oysters.—When in season oysters taken raw are nourishing and easily digested. Cooked they are less digestible, though permissible in some cases.

Oyster Broth.—Slowly simmer for ten minutes a pint of oysters in a half pint each of water and milk; season to taste and strain.

Clam Broth.—Equal quantities of clam juice and boiling water are seasoned with salt. Clam juice and clam broth are often retained in great irritability of the stomach.

Eggs.—Beaten light these are most digestible. One of the most frequent ways of giving them is in the form of eggnog.

Eggnog.—The white and yolk of an egg are beaten separately, very light; they are now stirred together, sweetened and salted, and to these are added a small amount of brandy, sherry or port wine, a little nutmeg and an ounce of milk.

Boiled Eggs.—Cooked eggs should be soft, as the albumen or white is otherwise hard and indigestible. Boiled for three and a half minutes or less they are, however, suitable. It is still better to put them into boiling water, remove them from the stove and allow them to stand in the hot water for seven minutes.

Powdered Yolk.—If eggs are boiled for an hour or more and cooled the yolks may be mashed into powder, which, with a little salt, is agreeable, nourishing and digestible. It may be taken plain or mixed with milk, whey or broth.

Egg Water.—In cases of extreme gastro-intestinal irritability the whites of two eggs stirred into a half pint of cold water, and sweetened or salted, may be given as a drink.

Vegetable Sick Foods.—Preëminent among the vegetable forms of aliment are the cereals, which in recent years have been so largely popularized by the introduction of scores of palatable, nutritious and digestible preparations. Many of these are already cooked, while others are predigested as well, so that they require little time or trouble in serving. A judicious selection from among these affords variety in taste and composition.

Wheat Foods.—These take the lead in nitrogenous constituents, followed closely by rye, barley, oats and corn; oats, corn and barley are richest in fats; rice contains chiefly starch; while oats contain the greatest amount of indigestible cellulose. This, however, in the finer preparations is largely removed. Of the wheat preparations, the following may be mentioned, rolled, cracked, crushed and granulated wheat, called by many names, according to where or by whom it is prepared, "vitos," "wheat germs," "germea," "wheatlet," "wheatena," "cream of wheat," "shredded wheat," and so forth. Gluten flour is supplied for the use of diabetics and those who cannot well take starch; and farina, a material similar to cornstarch, for the use by itself or in combination with other substances.

From the other cereals, similar preparations to those made from wheat are manufactured.

Following are the formulæ for preparing some of the foods in common use for the nourishment of the sick:

Milk Toast.—Remove the crust from two small slices of baker's bread, a day or two old; toast carefully, and cover with a half pint of scalded milk previously salted.

Boston Cream Toast.—Prepare as above, but thicken the milk with a heaping teaspoonful of flour mixed with the same amount of butter; these are to be carefully stirred into the hot milk and brought to boil.

Toast Water.—Cover well toasted, not burned, bread, with boiling water; set aside till cool, strain and salt or sweeten to taste.

Panada.—Cover split crackers or slices of toast with boiling water, previously sprinkled with sugar, salt and, if desired, a little nutmeg. Simmer gently until the product is like jelly. Serve while warm.

Flour Gruel.—Mix a tablespoonful of flour with enough milk to make a smooth paste; add a quart of boiling milk; boil for a half hour in a double boiler; salt.

Flour Ball.—Make a ball of a pint of flour which has been moistened with four tablespoonfuls of water; tie tightly in a cloth; dampen the outside of the cloth and sprinkle with flour; boil hard for ten hours. Remove the cloth and dry the ball for ten hours in an oven. Grate two teaspoonfuls of flour from the ball, mix into a paste with cold water and stir into a cup of boiling milk.

Farina Gruel.—Stir two tablespoonfuls of farina into a quart of water; boil until thick; add a pint of milk, salt and boil fifteen minutes longer. Serve with sugar and cream.

Arrow-Root Gruel.—Mix into a paste two teaspoonfuls of arrow-root with a little water; stir into a pint of boiling water or milk. Sweeten and boil for three minutes.

Oatmeal Gruel.—Boil two tablespoonfuls of oatmeal in a pint of water until smooth. Salt and strain.

Wine Jelly.—Pour two ounces of cold water on one-half ounce of granulated gelatine, and six ounces of sugar. Soak for fifteen minutes and stir into ten ounces of boiling water until dissolved. Add four ounces of sherry wine, strain through a jelly bag or coarse toweling and cool.

Iceland or Irish-Moss Jelly.—Thoroughly wash a handful of the moss and soak for one hour in a very little water. Stir into a quart of boiling water and simmer until it is dissolved. Sweeten and flavor, strain and cool. Serve with cream.

Flaxseed Tea.—Pour a quart of boiling water onto four tablespoonfuls of whole flaxseed and steep for three or four hours. The juice of two lemons may be added, and sugar if desired.

Barley Water.—Wash two ounces of barley; boil for five minutes and pour off the water. Add two quarts of water and boil down to a quart. Salt or sugar may be added. This is often employed to dilute milk.

Puree of Celery.—Cut into small pieces enough of the stalks of celery to fill a pint measure. Stew in a quart of water until tender. Salt, thicken with a little arrow-root and add a cup of milk. Boil for two or three minutes, stirring constantly.

Puree of Asparagus.—Proceed as for puree of celery, reserving the tips and discarding the stalks, after they are cooked.

Puree of Tapioca.—To a half pint of boiling water or milk, gradually stir in a tablespoonful of instantaneous tapioca. Add salt, and boil, with constant stirring until it begins to thicken.

Milk and Albumen.—Shake in a bottle for five minutes the whites of two eggs and two ounces of lime-water; add a pint of milk, sugar and sherry wine to taste, and shake five minutes more. Give a wineglassful every two hours.

Cocoa.—Dissolve a teaspoonful of Phillip's Digestible Cocoa in a little cold milk. Add to this a coffee cupful of hot milk.

Predigested Foods.—Attention has already been directed to the peptonizing of milk; the same process may be applied to gruels made from oatmeal, or other cereals, and to beef tea, thus artificially digesting them before they are taken. Peptonized meat preparations have the disadvantage of a disagreeable odor and taste, but they are highly nutritious.

Extracts of Malt.—These are also employed in predigesting cereals, "maltine," "diastoid," "diastase" and "extract of malt" are some of the preparations which may be used in this connection. One of the successful applications of modern pharmaceutical skill is that exhibited in the manufacture of these artificially digested foods, many of which supply in concentrated form ready for absorption and assimilation the most important elements of nutrition.

We conclude with formulæ for making the more important poultices, tinctures, ointments, syrups, and so forth, for some of which credit is given Drs. Warren and Thorndike.

POULTICES.

Mustard Poultice.—Stir a tablespoonful of ground mustard with water to make a paste. Spread on linen, cover with thin muslin, place on affected part. Renew if necessary.

Poke-Root Poultice.—Roast fresh poke-root until soft, pound it. Mix with cornmeal to consistency of poultice. Used on tumors to scatter them. Remove every four hours.

Charcoal Poultice.—Take bread and milk or Indian meal, make to consistency of poultice with water, stir in half a teacupful of pulverized charcoal. Good to clean ulcers and foul sores.

Slippery Elm Poultice.—Stir ground slippery elm bark in water to consistency of a thick paste. An excellent poultice for irritable sores.

Carrot Poultice.—Boil carrots until soft, mash them to a pulp, add lard or sweet oil sufficient to keep it from getting hard. Spread and apply. Excellent for offensive sores.

Onion Poultice.—Made the same way as carrot poultice. Excellent for slow boils and stimulating to indolent sores.

Bread Poultice.—Put needed quantity of boiling water in basin. Throw in bread or cracker. When these have soaked up all they will, pour off water. Spread half-inch thick on cloth and apply.

Lobelia Poultice.—Take one ounce each of powdered lobelia and ground slippery elm bark. Stir into hot weak lye to poultice consistency. Excellent when applied to wounds, fistula, felon, boils, erysipelas, insect stings.

Arrow-Root Poultice.—Mix two tablespoonfuls of arrow-root with as much cold water as it will unite with. Add boiling water and stir till a thick paste is former.

Oatmeal Poultice.—Stir oatmeal slowly into hot water, boiling water while stirring, till poultice thickens is reached, that is till it will not run when spread on the rag.

Indian Meal Poultice.—Made same as oatmeal poultice.

Yeast Poultice.—Mix half pint yeast with one pound flaxseed meal to make thick paste. Stir constantly while heating.

Flaxseed Poultice.—Stir flaxseed into boiling water till thick paste is formed. Spread on linen and apply hot.

SYRUPS.

Simple Syrup.—Dissolve two and a half pounds of sugar in a pint of water. Dissolve sugar by heating, removing any scum. Strain while hot. The addition of any medicinal substance to a simple syrup makes a compound syrup.

Syrup of Squills.—Add two pounds of refined sugar to one pint of vinegar of squills, and proceed as in simple syrup.

Syrup of Seneka.—Mix four ounces of fluid extract of seneka with one pint of water. Dissolve in the liquid one pound of refined sugar and proceed as in simple syrup. Useful in colds and coughs, in frequent doses of one or two teaspoonfuls.

Syrup of Rhubarb.—Add to six pints of simple syrup, two-and-a-half ounces of crushed rhubarb, half ounce each of crushed cloves and cinnamon, two drachms of bruised nutmeg, two pints diluted alcohol. Evaporate liquid by a gentle heat, to a pint. Excellent for bowel complaint, in drachm doses every two hours till it operates.

Syrup of Lemons.—Boil for ten minutes a pint of lemon juice, strain, add two pounds refined sugar and dissolve. When cold, add two-and-a-half fluid ounces of alcohol. A fine addition to drinks in fever cases and good to disguise the taste of medicines.

Syrup of Citric Acid.—Add one pint of simple syrup to two drachms of powdered citric acid and four minims oil of lemons; add another pint of simple syrup and dissolve by gentle heat. An agreeable cooling addition to fever drinks.

Syrup of Ginger.—To a quart of simple syrup add two ounces of tincture of ginger. Evaporate the alcohol by gentle heat. Added to other medicines to improve flavor. Excellent to remove wind from stomach and as a stimulant.

Syrup of Garlic.—Slice and crush six ounces of fresh garlic, add one pint of acetic acid and two pounds of sugar. Macerate four days in glass vessel. Express and filter the liquor, till a pint has passed. Bottle. A teaspoonful will relieve bronchial affections in children under one year old. Larger doses according to years.

Syrup of Wild Cherry.—Steep two and a half pounds coarsely powdered wild cherry bark in a gallon of water. Strain and dissolve in it by heat as much sugar as will make thick syrup. A good tonic and excellent to mix with medicines for dyspepsia, consumption, and so forth.

TINCTURES.

Tincture of Snakeroot.—Steep for two weeks three ounces of crushed Virginia snakeroot in a quart of diluted alcohol. Express and filter. Good for low states of the system, in teaspoonful doses, three times a day.

Tincture of Rhubarb.—Add to a quart of diluted alcohol three ounces of crushed rhubarb and one ounce of crushed cardamom. Steep two weeks; express, filter and bottle.

Tincture of Opium.—Add to two pints of diluted alcohol two and a half ounces of opium. Steep for a fortnight; express, filter and bottle. This is the preparation known as laudanum. The dose should not exceed ten to twenty drops.

Tincture of Lobelia.—Add to a pint each of vinegar and alcohol four ounces of lobelia. Steep two weeks; draw off and filter. Dose as a nauseant, thirty to fifty drops.

Tincture of Cinnamon.—Add to one pint of diluted alcohol two and a half ounces of powdered cinnamon. Steep for two weeks; express and filter. Dose, two to four teaspoonfuls.

Cayenne Pepper Tincture.—Steep for two weeks an ounce of powdered cayenne pepper in two pints of diluted alcohol. Express, filter and bottle for use.

Tincture of Orange Peel.—Add to one quart of diluted alcohol four ounces of dried orange peel. Steep for a week; express, filter and bottle for use.

Tincture of Cantharides.—Steep for a fortnight an ounce of crushed Spanish flies in two pints of diluted alcohol. Dose, twenty drops, three times a day.

Tincture of Valerian.—Steep for a fortnight four ounces of crushed valerian in a quart of aromatic spirits of ammonia. Express and filter. Used in nervous diseases in one- or two-drachm doses in sweetened water.

Tincture of Myrrh.—Steep for two weeks four ounces of crushed myrrh and two ounces of capsicum in four pints of alcohol. Express and filter. Good externally and as an occasional remedy for flatulence.

Tincture of Peruvian Bark.—Steep for two weeks twenty ounces of diluted alcohol, to which has been added two ounces of red bark, an ounce and a half of crushed orange peel, three drachms of Virginia snakeroot and one drachm of saffron. Express and filter. A stomach cordial, and good in low fevers. Dose, two to four drachms three times a day.

Tincture of Aconite.—Mix eight ounces of powdered aconite root with one pint of alcohol. Steep for a fortnight, stirring occasionally. Express and filter. Good in fevers and inflammations. Dose, three drops in water every hour or two.

Tincture of Saffron.—Steep for a fortnight one ounce of saffron in a pint of alcohol. Express and filter. Same proportions of castor and leptandria to alcohol, make their respective tinctures.

Camphor, oil of peppermint, oil of spearmint and asafetida, in proportions of two ounces each to a pint of alcohol and steeped and treated as in tincture of aconite, make their respective tinctures.

So cardamon, cochineal, colombo, ergot, galls, hemlock, cubebs, henbane, lobelia, poke, blood-root, squills, bittersweet and belladonna, in proportions of two ounces each to a pint of diluted alcohol, and steeped and treated as in cases of tincture of aconite, make their respective tinctures.

OINTMENTS.

Sulphur Ointment.—Melt half a pound of lard, and add one ounce sulphur, one drachm each of ammoniated mercury, benzoic acid, sulphuric acid and oil bergamot, and two drachms of nitrate of potassa. Stir constantly till cold. An excellent ointment for itch.

Pile Ointment.—Add to a quart of water three handfuls each of witch-hazel bark, oak bark and apple tree bark. Boil to a pint and strain. Add half a pound of lard, and simmer till water disappears. This forms an ointment valuable as a pile remedy.

Tar Ointment.—Melt a pound of suet. Add the tar. Stir till cold. Excellent ointment for scaly eruptions like scald head.

Spermaceti Ointment.—To a pint of olive oil add five ounces of spermaceti and fourteen of white wax. Melt together, stirring constantly. Good dressing for blisters and burns.

Simple Ointment.—Melt a pound of white wax with four pounds of lard. Let the heat be gentle, and stir till cold.

Poke Ointment.—Mix a drachm of extract of poke with one ounce of lard. Good for ulcers, itch, scald head, etc.

Oxide of Zinc Ointment.—Rub together half an ounce of oxide of zinc and three ounces of lard. Good for eruptions of skin and sore nipples.

Ointment of Galls.—Rub together six ounces lard, six drachms powdered galls and a drachm and a half of pulverized opium. Good for piles.

Belladonna Ointment.—Mix an ounce of lard with a drachm of extract of belladonna. Affords relief in neuralgia and painful tumors.

Ointment of Bayberry.—To half a pound of tallow add half a pound each of turpentine and bayberry, and four ounces of olive oil. Good application for scrofulous sores and ulcers.

Lead Ointment.—Add two and a half drachms of powdered acetate of lead to two ounces of white wax and four ounces of lard. Melt together, stirring till cold. Good for burns, scalds, ulcers and cuts.

PLASTERS.

Spiced Plaster.—Mix an ounce each of powdered ginger, cloves, cinnamon and black pepper with one drachm pulverized cayenne. Add a fluid ounce tincture of ginger and enough honey to make stiff poultice. A plaster of this applied to stomach stops nausea and vomiting.

Lead Plaster.—Melt one pound lead plaster, add two ounces each of linseed oil and tincture of opium, six ounces of oil of turpentine and eight ounces of oil of organum. Stir together till cold. Good for burns, chilblains, scalds, etc.

Capsicum Plaster.—Mix half pound resin and two ounces beeswax. Add a pint of spirit, in which two ounces of cayenne inclosed in bag has been steeped in gentle heat for two hours. Evaporate the spirit by gentle heat, add an ounce of powdered camphor. An excellent stimulating plaster.

Belladonna Plaster.—Melt three ounces of resin plaster and add an ounce and a half of extract of belladonna. An excellent application in neuralgia and rheumatism.

CURATIVE MEDICINE.

PART XVII.

CARE DURING CONVALESCENCE.

Definition.—The word convalescence is derived from the Latin *convalescere*, meaning, "to grow strong." It is the period of recovery after disease, the state midway between the final cessation of the disease and complete restoration to health. Although it is applicable to the periods of improvement in the course of chronic ailments, yet it is generally used in connection with the acute or self-limited diseases.

Importance of Obedience.—Since convalescence is the termination to which proper treatment, nursing and strict obedience to all the instructions contained thus far in this volume would naturally lead, except in cases of chronic, incurable diseases and old age, for which no cure has as yet been discovered, it may appropriately conclude the sections on preventive and curative medicine—substantiating the *prognosis*, or the predictions as previously set forth.

CAUSE.

Overbalancing Disease.—When disease fastens itself upon the human organism the outcome or result depends entirely upon the resisting power of the different tissues and organs. If tolerance is maintained and the several functions are not arrested, the disease will be overbalanced by the vitality and resisting power of the body.

Failure of Response.—But if the different tissues and organs do not respond to the increased tax made upon them; if they grow progressively weaker, the disease will constantly find additional means of spreading and ultimately the forces of the body are arrested and death ensues.

The Causation.—The causation of convalescence is, therefore, the response of living tissue to injury, the rallying of the vital forces, which overpower the disease and its primary cause, whether it be due to the countless microörganisms, to neglect, exposure, or the many unknown factors.

Sign of Convalescence.—Just how convalescence is established we do not know, just how or when the resistance first exerts itself is a mystery, yet that it is a fact is evident, for in some diseases convalescence can be noticed almost from the moment it begins.

Termination by Lysis.—In certain diseases there is resolution by gradual subsidence, the fever growing less and less each day, until normal temperature is reached; while the strength increases and the faculties brighten. After the fever has entirely subsided the improvement is much faster and convalescence is rapid, although very often a long time is required to bring the patient back to his usual health. This is called *termination by lysis.*

Termination by Crisis.—In other affections, as pneumonia, the turning point to health is pronounced and plainly evident. Very often the change can be noticed inside of a very few moments, and within twenty-four hours convalescence is established; recovery following rapidly. This is styled *termination by crisis.*

Recuperative Force.—But in both cases the termination is due to the recuperative power being stronger and more vigorous than the cause of the disease—and it is therefore simply a question of the stronger overcoming the weaker.

Recovery in Certain Diseases.—As will be seen further on, under the paragraphs dealing with the convalescence of the special affections, there are many diseases which run a certain, definite course, both as to length, severity and convalescence. In these diseases, one familiar with the science of medicine can form a very accurate opinion as to the initiation of recovery, and foretell with a fair degree of accuracy the duration of the convalescence. This information is gained by comparing the records and statistics of many thousands of cases, using the average as a basis and applying the particular patient's symptoms and conditions with it.

SYMPTOMS OF CONVALESCENCE.

Convalescence presents some very different characters according as it succeeds to acute or chronic affections—in the former case it is clearly defined and noticeable, even to a superficial observer.

Its Commencement.—This is often marked by critical phenomena, and always by the cessation of local pain or general symptoms of the disease. To the patient himself it announces its welcome advent by a feeling of ease and comfort previously longed for in vain; whilst to the physician it makes itself known by reliable characteristics—such as a natural and peaceful expression of the countenance, vivacity and clearness of the glance, susceptibility, and, as it were, curiosity of the senses, an agreeable change in the disposition, and a tendency to gayety, a prolonged and refreshing sleep and a greater mobility of the circulation.

The Encouraging Signs.—These do not all make their appearance simultaneously, but generally follow each other in groups at short intervals, often merging together.

Almost always the first phenomena of returning health develop themselves amidst the fading evidences of illness, but occasionally we observe in individuals of vigorous constitution transitions from disease to convalescence occur with marvelous rapidity.

Recovery in Chronic Cases.—In recovery from chronic maladies the physician is not often called upon to assist at such kaleidoscopic changes from disease to health. The functions of the organism do not reëstablish themselves with the same promptitude, nor in the same almost simultaneous manner. They become regulated, as it were, one by one, in consequence of careful and individual attention, and even when restored to their physiological type they are wanting for a long time in force and endurance.

After Chronic Illness.—The loss of adipose is often not repaired until after months or even years of convalescence, and the countenance frequently retains for a great while the imprint of the sufferings which have been endured, while after the acute diseases, such as the fevers, the acquirement of flesh is usually rapid, often increasing the weight above the normal limit.

Hunger.—If we consider the symptoms of convalescence a little more closely we will find that hunger is one of the first and most important manifestations of returning health after an acute disease. The appetite for food is sharp, and renews itself after a very brief period; sometimes it is even voracious.

Eating becomes in many cases the great, perhaps the sole, aim of the convalescent; and when he happens to be of an age when growth is not yet terminated, and when, consequently, assimilation is normally active, he is apt to seek the gratification of this voracity with arguments and supplications which render it very difficult for the physician or nurse to enforce a proper regulation of the diet.

In military hospitals it is often necessary to resist the tears and most vehement prayers of convalescents in order to preserve them from dangerous and fatal consequences of their own excesses.

Heart and Circulation.—As hunger is the demand on the part of the attenuated tissues for more nourishment, so is the strengthened circulation due to the need of the body for more oxygen and less carbonic acid gas.

Circulation in Convalescence.—During convalescence the circulation presents a singular impressionability—the pulse is often slower than in health, falling sometimes as low as forty, or even thirty-five beats per minute; but it is very excitable and is accelerated by the slightest cause. The simple act of changing the position or attitude will increase its rate greatly, while the approach of a stranger, especially the physician, the slightest worry or mental excitement, will at once increase the pulse rate.

Pallor and Flushing.—The increased mobility of the circulation gives rise to ultimate pallor and flushing of the face upon the slightest cause. A delicate softening of the skin and transient perspiration are also due to the easily-influenced circulation and the low muscular power.

The Pallor.—The pallor of convalescence arises, not by the emptiness of the blood-vessels, as was formerly believed, but from the diminution in the quantity of red blood corpuscles; in consequence of the prolonged abstinence from the proper amount of food or its malassimilation.

Blood Corpuscles.—This diminution is determined by the ingenious hæmatimeter of Hayem and Nachet, by which the number of corpuscles in a given amount of blood are counted—from which it is easy to compute the percentage in the entire arterial system. A cubic millimeter of normal blood contains about five million red blood corpuscles, yet in convalescence we often find as low as two million corpuscles in the same quantity.

Red Blood Corpuscles.—These are the carriers of oxygen to the different organs and tissues of the body; consequently when we find the carrying power so greatly diminished we can readily understand the many symptoms of an impoverished circulation. One of the best examples seen of this is in the excessive sensitiveness to cold due to lessened oxidation. Again we find vertigo and dizziness due to anemia or imperfect blood supply of the brain, and palpitation of the heart.

Respiration is not affected during repose and quietude, but slight muscular effort causes fatigue and shortness of breath; this is especially noticeable after ascending a short staircase, and is caused by impoverished blood, together with some slight febrile action.

Need of Oxygen.—For as muscular activity is destructive to the body it is necessary that carbonic acid gas ($C O_2$), the product of such destruction, be carried away, and that oxygen be returned to the tissues in order that they may recover from the loss. The convalescent's blood is not as able to perfectly carry out this function as the blood of a healthy individual, hence the lungs are required to put forth extra respiratory efforts, and shortness of breath results.

Digestion.—Constipation is the rule rather than the exception in convalescence, and is due to the enforced quietude, the diminished secretions from fever, the febrile reaction and the lessened food supply. The tongue which has been coated, or hard and baked, as the case may be, gradually clears off, becoming soft and moist as the bowels are regulated. And disturbance of the stomach, as nausea and vomiting, discomfort after eating, and so forth, ceases under proper diet, and the extreme thirst disappears. The digestive symptoms will be mentioned more fully further on, under the special diseases.

Urine.—The urine during convalescence becomes more abundant (usually from forty to fifty ounces in twenty-four hours) and less fully charged with uric acid than in health. It ceases to present the dense, high-colored and strongly odorous character met with in disease, and if it has contained albumen or sugar this will disappear, unless the acute disease has developed into a chronic one.

If, during the course of the disease, there has been an involuntary voidance of the urine, the desire to urinate frequently and the inability to perfectly control the urine will be felt for some time during convalescence. This, however, will return to normal as the patient regains health and strength.

Sexual Powers.—In females the menstrual discharges are reëstablished during convalescence, and in many cases the genital organs show marked activity—married women becoming pregnant soon after convalescence. In the male convalescing from acute diseases, there is generally an energetic stimulation of the sexual functions. After convalescence from chronic diseases, middle-aged patients frequently suffer a loss of sexual appetite and emations. Cases of sexual weakness, discharges, and so forth, following acute diseases, are generally transient and leave no untoward effects.

Skin and Hair.—The outer layer of the skin, or the epidermis, the hair and the eyebrows, are frequently shed during convalescence; but this loss is as a rule only temporary.

Muscles.—The muscles after sickness are more or less emaciated and flabby; this varies greatly after different diseases; some acute diseases causing a very rapid loss of flesh, while others are more like chronic ailments, in that the emaciation is slow and progressive. The muscles of the abdomen are usually soft and flabby, while the long muscles of the legs and arms lose their firmness and are easily separated one from another. The muscular tissue of the several organs are also affected, being unfiltrated with fat, decidedly inactive and subject to tissue change.

Muscular Movement.—Muscular movement, for a long time, fails in that energy and precision which marks a state of complete health, and all the organs display an inability to react against, or to withstand, any of the innumerable outside influences with which mankind is surrounded, as they would normally do.

Sleep.—The sleep of convalescence is sound and refreshing, losing the disturbed character which it had during illness and becoming calm and tranquil. As there is perfect rest, both physically and mentally, during normal slumber, the convalescent should be allowed a large portion of the day in which to sleep undisturbed.

Mental Powers.—The mental powers, both of perception and reasoning, gradually return during convalescence, but for a long time patients have little endurance, becoming easily fatigued and exhausted after mental exercise. After a severe, acute malady, such as typhoid fever, the intellectual faculties are often very slow in returning to their original integrity, and months or even years may elapse before the patient enjoys his full mental vigor.

Mental Disturbance in Childhood.—In certain acute diseases peculiar to childhood, such as scarlet fever, meningitis and diptheria, there is often mental disturbance, and while it takes a long time before the mind recovers its normal state, yet in such cases the outlook is generally favorable.

Loss of Mental Power in Adults.—In adult patients who are convalescing from nervous disorders, the loss of mental power is serious, and the full vigor of the mind is seldom acquired.

Convalescence of Old People.—In elderly people, a convalescence often hastens the physiological loss of mental power—the loss being especially appreciable to themselves and their associates, inasmuch, as it is sudden, instead of coming on gradually with each succeeding year.

COMPLICATIONS OF CONVALESCENCE.

How frequently we hear that a certain patient has "had a relapse." Yet in the majority of cases, such a relapse is due to some neglect or carelessness; and to impress upon the reader the danger of complication during convalescence, we take up a few of the most common points in connection with it. First, we will consider the causes which can be averted in most instances. They are improper feeding, exposure, over-exertion.

Improper Feeding.—If the desire for food returns slowly and is capricious in its choice for articles for diet; if the patient is quickly disgusted and wishes to change his bill of fare daily; if, in eating, he does not experience the pleasure which accompanies the satisfaction of a real want of the organism, and if, during digestion, acid eructations, flatulence, flushing of the face and distinct febrile movement cocur, convalescence is not yet sufficiently advanced to permit gratification of the appetite and diarrhœa is apt to supervene on such indulgence. Should it do so, whatever progress toward health has been made by the organism is often more than obliterated.

The Complications which must be watched for in connection with the diet are, diarrhœa, vomiting or nausea, acid eructations, belching of wind, flushing of the face and fever. When any one of these symptoms are noticed, look to the food and see if a reason cannot be found.

Exposure due to cold draughts, cold moist air, an over-heated or ill-ventilated room, poor sanitary conditions, may complicate the disease. A patient convalescing from typhoid fever may contract bronchitis or pneumonia from atmospheric exposure, and in his weakened condition the result is to be feared. A pneumonia may be complicated by typhoid fever due to defective sanitation, filthy bed-linen or sick-room vessels. These are most important details which must not be overlooked, as proper attendance to hygiene and dietetics is the sheet-anchor during convalescence.

Over-Exertion.—A heart weakened by disease is not calculated to withstand the sudden demands made upon it by severe exercise. An intestine just healing after ulceration is not prepared to undergo the straining efforts made at stools while in the erect posture.

Gradual Exercise.—Consequently in allowing a convalescent to exercise it must always be remembered just how weak all the organs are, especially the one which has been the main seat of disease. It is better to keep a patient quiet in bed, in spite of his protestations, than to allow him to over-exert. Moderate exercise, gradually increased, will be just as acceptable, and the termination is certainly more certain by success. The length of time that a patient must be kept in bed after sickness varies with the disease, its length and intensity. But generally speaking, a patient should not be allowed to get up until the fever and all other symptoms have been absent for at least ten days, and then the periods of exercise should be gradually increased as strength is regained.

Complications in Convalescence.—Certain diseases have a particular disposition toward complication during the convalescent period—while such conditions cannot always be prevented, they can at least be expected and preparation made to combat them. In the convalescence of diphtheria, for instance, one must constantly be watchful of any nervous symptoms which may arise; paralysis of different portions of the body, especially of the heart, is a very common complication and should be treated energetically. Scarlet fever is often complicated by acute Bright's disease, heart affections and disease of the middle ear. Pneumonia or influenza may insidiously lead into consumption, unnoticed, except for constant watchfulness. In fact, during convalescence, the patient should be kept under the closest supervision; the smallest details must be noticed and acted upon immediately. By so doing many secondary diseases, both chronic and acute, may be aborted in their infancy.

TREATMENT OF CONVALESCENCE.

When a malady is terminated, sanitary science, which had previously labored in conjunction with therapeutics to extinguish the morbid tendency, resumes sole charge of the patient and directs the convalescence, during which the individual, although no longer sick, is not yet in a state of perfect health. In convalescence the functions, although brought to an equilibrium, are still wanting in energy and in stability; the entire organism, more or less shaken by the attacks to which it has been subjected, reëstablishes slowly, and, as it were, step by step, in its connections and its reactions with the external world.

Hygiene being the preëminently powerful agent in the management of convalescence the following sanitary rules are worthy of particular attention:

Protective Treatment.—The convalescent should be protected with special care against variations in temperature, from the baneful influence of cold air, of currents of air and from the effects of moisture. In the condition of his system he is particularly apt to be affected by these agents, which may readily bring on a relapse, or some more or less serious complication.

Ventilation.—What has just been said does not mean that the patient is to be denied plenty of pure air; for as we have shown in preceding paragraphs, oxygen is as much a necessity to the human economy as is food. A patient should be allowed at least 1,500 cubic feet of air space and the air should be changed once in every two hours. To do this requires some ingenuity if the sick room is not supplied with special ventilating apparatus—for the first air should be warm and dry.

A Simple and Effective Method.—This is to admit the fresh, outside air into an adjoining hallway or room which can be heated. From this room the warm, fresh air may pass into the sick-chamber through an open door or window; the patient's bed being so placed as to be out of any direct draught or current of air.

Clothing.—In order to secure immunity from atmospheric exposure it is necessary that warm clothing should be worn—thicker and warmer than the clothing usually worn at the corresponding season of the year. Wool or silk under-garments are by far the best as they radiate the body heat and moisture gradually and are less apt to cause a feeling of chilliness after perspiration. If the weather is very warm, light-weight wool garments can be procured, which will be but little warmer than cotton or linen and at the same time preserve uniform body temperature.

Baths should be indulged in only near the end of convalescence, when health appears to be almost fully established. They should be very short and taken at least a half an hour before and two hours after a meal. It is well to employ those of a stimulating character, such as salt baths, bran baths, baths containing alcohol or whiskey, and so forth. Great precautions should be observed against the slightest exposure to draughts of air for some time after coming out of the water. After bathing the body should be well dried with rough bath-towels, rubbing the skin vigorously enough to bring a healthy glow to the surface. During convalescence from diseases of the respiratory apparatus baths should be strictly forbidden. (The previous remarks do not apply to baths administered during the active period of the disease, for the purpose of reducing fever, cleanliness, and so forth.)

Massage is beneficial in most cases of convalescence after they become strong enough to withstand the somewhat vigorous manipulations. The motions of massage differ in character; beginning with firm stroking with the palms of both hands they gradually change to a kneading motion, and end with percussion or a rapid tapping of the muscles.

Massage is generally practiced upon the bared skin, using enough fresh cocoanut oil to enable the operators hand to glide easily over it and render the skin soft and pliable. The object is to bring fresh blood to the muscles and stimulate the tissues to greater activity, and consequently is of great value in convalescing cases in which the muscles are soft and flabby and the circulation sluggish.

Food of Convalescence.—The diet must be carefully regulated and the following rules rigidly adhered to: In the first place, proportion the amount and character of the nourishment, not to the hunger of the patient, but to the digestive power of his stomach. Instruct him to eat often and but little at a time, to chew the food very thoroughly, not only to secure its reduction to small particles, but also its complete admixture with the salivary fluids. And lastly, to choose those articles of diet which are adapted to the comparative feebleness and sensitiveness of the digestive organs and as far as possible, also, those which gratify the taste of the individual.

Generous Nourishment.—We must guard, however, against a disposition to restrain the patient too much in regard to nourishment, through an exaggerated fear of the effects which it may produce. It is essential to take into consideration the degree of appetite and the sensations which the convalescent experiences during the process of digestion. Also to consider how his illness has effected the several digestive organs, for, of course, the kind and quantity of nourishment must vary with the nature and duration of the illness from which recovery is taking place.

Examples.—For instance, a patient who is convalescing from typhoid fever, which has its seat in the intestine, should not be allowed to eat plentifully of foods which receive a large part of their digestion in that organ, as fats, starches, and so forth. Nor should a patient who has had a congested liver partake of fatty food to any great extent—simply because bile is required to digest fats and the disease has to do with a lessened supply of bile.

The Patient Must Diet.—Stimulating food given to an intensely nervous patient would only aggravate the condition, while a routine diet, without change or character, would be torture to one recovering from a long, chronic illness.

In other words the diet must suit the patient, not the patient the diet. There are many cases in which physicians and nurses gain more credit with a patient and his friends by a very minute attention to the diet during convalescence than by the most skillful treatment of the disease throughout its course.

Diet.—As a general rule a patient may begin with weak chicken or mutton broth, free from fat, and boiled rice, which probably represent the two great classes of nitrogenied and amylaceous articles of food in their most easily assimilated form. Experiments have shown that rice is digested in less time than any other substance of the kind, only requiring one hour. The rice may be substituted by tapioca, sago or cornstarch, made with milk, if these are more palatable, according to the directions on a previous page.

Progressive Diet.—After from two to four days, if improvement continues, administer stronger soups, eggs very slightly boiled, calf's-foot jelly, rice-pudding and toasted bread, or stale bread with very little butter, In the course of a week the patient may proceed to a mealy roasted white potato, a tender mutton chop, or tender loin of beef, and light bread not less than twelve hours old, with sweet butter in moderate quantity.

It is much better and saves time for the invalid to go up the inclined plane of diet (never to ascend this hill of difficulty by jumps) a little slower than is absolutely necessary, than to advance too rapidly and bring on a relapse.

A Correct Guide.—The surest guide is the condition of the tongue; should that unruly member have cleaned off, as it usually does when full, frank convalescence sets in, go on carefully and cautiously up the list given above to stronger and more nutritious articles of diet. But should the tongue put on a coat of fur again, remember it is a sign of repugnance to such rich food as it has to help to swallow, and quickly taking the hint, put the patient back on liquid diet for a few days longer.

Medical Treatment.—During convalescence the secretions and excretions must be carefully watched over and any excess or insufficiency be corrected as soon as practicable. The patient should be encouraged to drink a great deal of water (between meals, and not at meals—this also, applies to the healthy individual) for water is an absolute necessity to the secretions, which if right will bring health much closer to hand.

Copious Perspirations, which are very apt to occur from simple relaxation of the tissues and integument, may be checked by six or eight grains of quinine, or by one-hundredth of a grain of atropia, or by sponging with a solution of alum and whiskey before retiring.

The Urine.—If the urine is rather scanty the patient should drink freely of water, or of some bland fluid, such as flaxseed tea, toast-water or gum-arabic water.

Constipation.—Constipation should be overcome by injections, or by tonic laxatives, such as rhubarb, in doses of five or ten grains daily. If convalescence is protracted and the patient does not regain strength as fast as should be expected a tonic containing iron and strychnia is indicated.

Surroundings of the Patient.—Those who have suffered from a protracted illness will remember how monotonous it became to lie in bed with your vision limited to one side of the room, or to a narrow strip of sky or landscape which could be seen through some particular window. You soon learned every detail of the room and its furniture; even the figures on the wall-paper took on grotesque forms and seemed perfectly hateful to you.

Chamber Arrangement.—Consequently the furnishing of the sick-chamber, the arrangement of the bed gives us another topic in connection with the treatment of convalescence. While the sick-room should have as little furniture in it as possible (especially if the disease be contagious or infectious), yet what there is should be arranged with a view to cheerfulness and brightness.

Flowers.—Flowers or potted plants, brought in from time to time, give the patient a change and brightens him up. If possible the position of the bed should be changed from one part of the room to another so as to give the enforced occupant a new field of vision, especially if it be so that he can look out of a window. All these little details make sickness more bearable; taking away the gloomy thought goes a very long way toward establishing a speedy convalescence.

Visiting.—During the tedious convalescence which we often watch so anxiously after prolonged chronic diseases, or after relapses from more acute attacks, visits are capable of accomplishing great good if properly managed. Every care should be taken not to depress a patient who is slowly recovering, by allusions to unfavorable terminations in cases similar to his own. A sick person does so enjoy hearing good news; for instance, of a love and courtship which has a happy ending. Sick persons also intensely enjoy hearing of any material good, such as a positive or practical success of the right in their own neighborhood or country, or, indeed, in any part of the world.

Books.—They have generally a surfeit of books, principles, precepts and theories; so, instead of advising them about their convalescence, with advice which they have heard at least fifty times before, tell them of one benevolent act which has really succeeded practically—it will be like a day's health to them. It is hard for people to understand how intense is the craving of invalids, who, with reanimated powers of thinking, are still cut off from active participation in the world's work and progress, to hear of good, practical action even when they cannot yet partake of it.

Society.—In many instances there is no better society for a convalescent than that of babies, or of other invalids who are also convalescent; but, of course, this association must be carefully managed so that neither party will suffer from it, which is perfectly feasible as a rule. If you think the air of a sick-room is bad for an infant, of course it is injurious to the invalid also; and efforts should be made to remedy the aerial impurity without a moment's delay. It enlivens a sick person's whole mental atmosphere to see "the baby," and a very young child, if unspoiled, will generally adapt itself wonderfully to the ways of a sick person if the time they spend together is not too long. A small pet animal is often an excellent companion for a convalescent patient, especially if confinement to the house in consequence of unfavorable weather or complications of the original disease setting in, is unusually prolonged. A pet bird in a cage has sometimes proved the only pleasure, or, indeed, solace of an invalid shut up in the same room for weeks, or even months. If such a pet can be fed, cleaned and taken care of in every way, and perhaps taught some of the little tricks which birds, squirrels and even mice are capable of learning, and which prove such a source of pride to the trainer and entertainment to visitors, the patient should by all means be encouraged to undertake the task. By such devices many a weary hour has been whiled away, and the sick-chamber of lingering convalescence shorn of half its almost intolerable weariness.

First Walks.—The first walks or rides should receive special attention, the convalescent being warmly clothed, a warm sunshiny day being selected, in accordance with the rules given under meteorology, and the exposure being at first for only fifteen minutes, or half an hour at the furthest.

Change of Air and Scene.—After the invalid is strong enough to leave the house complete change of air and scene is one of the most potent contributors to an entire restoration to health. The patient, who has remained for three weeks in nearly the same state, growing neither better nor worse, will often wonderfully improve after a few days spent in the country or at the seashore. If the period of sickness has been passed in a room where the only view was of the backs of houses or the fronts of those forming the opposite side of the street, how grateful and invigorating is the sight of green fields, shady groves and sparkling streams at some sylvan retreat. By the ocean, too, vitalizing sea breezes frequently exert an almost magical power over a frame enfeebled by disease and restore to the languid convalescent his wonted vigor with astonishing rapidity.

Avoid Excitement.—Lastly, try to secure the patient against any intense mental emotion or intellectual excitement, which will be almost sure to react with unfavorable effect upon his enfeebled physical powers.

Reconstructive Remedies.—These must be administered in a form ready to be taken up by the assimilative functions and transferred to the wasted tissues. Chemistry teaches us the exact nature of the elements destroyed by disease, and thus gives the clue to rational scientific treatment. There is need of food structure for muscle, blood, nerve, bone and the numerous other tissues. The need is a complex one, and the remedy must be, likewise, complex in its chemical nature. It is true that *all* the elements of the tissues have been wasted; but there is one element which, because of its vital importance and wide distribution throughout the economy, must be specially provided for—this element is phosphorus.

A Question.—The question naturally arises: Is it possible to obtain a remedy that will meet all the requirements for checking the ravages of disease and replacing the structures wasted by the pathologic processes, *i. e.*, for checking destructive metabolism and fostering constructive metabolism?

The Blood.—It is self-evident that before a patient can reach convalescence the germ or virus causing the disease must be removed from the system. How shall we combat these germs? We cannot rely on sterilization. Happily we have discovered that normal, healthy blood is antagonistic to germ life, while impoverished blood furnishes a favorable nidus for their development.

Hypophosphites.—Experience has demonstrated that the remedy that fulfills all the indications for treatment is the **Compound Syrup of Hypophosphites.**

This remedy is based upon the broad philosophic basis of the exact needs of the system in diseases characterized by waste of tissue and loss of nervous force.

Its action is both rational and physiological. It conserves and imparts energy, sustains the system, resists the inroads of disease, and quickly enables the digestive functions to resume their normal power. It is a tonic, satisfying hunger and imparting a grateful sense of strength and comfort.

It is specially designed for the treatment of that large class of diseased conditions characterized by a general lowering of the nerve and vital tone, resulting from impaired nutrition and due to gastric debility or an atonic condition of the intestinal canal.

It should be used in teaspoonful doses, given in a wineglass of water before each meal and at bed-time.

Book V.

MEDICAL MATERIALS; THEIR PROPERTIES AND USES.

PART I.

INORGANIC (MINERAL) MATERIALS.

Importance of Drugs.—Drugs have to-day a very wide and important claim to our attention from the fact of their wide application. Those in more common use should be understood by the laity, while a knowledge of the rarer drugs should be close at hand, should we wish to learn of them. Drugs are our friends, but, like friends, must be properly and carefully used; in cases where not so used they prove a detriment rather than a benefit.

All Nature Assists.—For purposes of healing nature gives her vital forces in the form of plants and animals. Those forms of nature without life lend their aid, and thus some very important remedies come from the mineral kingdom.

Divisions of the Subject.—Our subject is therefore divided into parts depending upon the source. Part I deals with drugs from the inorganic kingdom; Part II treats of drugs derived from the organic kingdom, and Part III shall be devoted to animal juices and extracts. These latter are among the newer remedies and, though strictly speaking, they are of organic origin, they are especially prepared in or from the animal body. The application of the drugs shall be given. Formulæ are not given, but such as are in common use will be found carefully and fully written under "Medicinal Prescriptions," "Home Administration of Medicines," and elsewhere.

The first in alphabetical order of the INORGANIC MATERIALS is:

ALUM (Alumen).

Definition.—A double sulphate of potassium and aluminium.

Property.—It may cause vomiting. Locally it checks bleeding.

Use.—It acts as a styptic, astringent and emetic.

Manner of Using.—As an emetic a teaspoonful is the dose for a child and a tablespoonful for an adult, and it should be given in syrup. A lotion of alum and whisky is very useful in the prevention of bed-sores.

AMMONIUM (Ammonium).

Definition.—The salts are derived from the gas, ammonia.

Property.—It stimulates the heart. Weak solutions excite the flow of gastric juice. It is an antagonist to acids.

Use.—It may be used in cases of fainting or in cases of heart failure. Weak solutions are used as a sub-acid.

Manner of Using.—The aromatic spirits may be used in water, a teaspoonful as a dose. It should be remembered that this affords but temporary relief. Locally the liniment is useful.

ARSENIC (Acidum Arsenosum).

Definition.—Occurs as a white powder or in dense masses of crystals.

Property.—It serves as a stimulant to the nervous system, and in small doses improves the appetite and digestion.

Use.—Its properties indicate its use. Its stimulant effect upon the nervous system is made use of in the treatment of St. Vitus' dance. Preparations are used locally.

Manner of Using.—The common form used internally is called Fowler's solution, which is used in doses as high as ten drops. For local use a concentrated preparation is employed. In all cases arsenic is to be used with extreme caution, as it is very apt to produce symptoms of poisoning.

BISMUTH (Bismuthi Subnitras).

Definition.—A heavy white powder.

Property.—It has a soothing influence on the gastro-intestinal or digestive tract. Locally applied it is sedative and exsiccant; that is to say, it dries up excretions.

Use.—In cases of diarrhœa large doses are employed for the astringent effect. Locally it is employed in the treatment of burns and in skin diseases, where there is secretion to dry up.

Manner of Using.—It may be taken as a powder or in mucilage of acacia.

BORIC ACID (Acidum Boricum).

Definition.—It appears as colorless, transparent six-sided plates.

Property.—The influence of boric acid is sedative and destructive to low forms of organized life.

Use.—As a sedative and antiseptic.

Manner of Using.—Internally it is given in the form of a powder. For external application a lotion is prepared by dissolving the acid in water.

CALCIUM (Calcium).

Definition.—A metallic substance, the oxide of which constitutes lime. Chalk is scientifically called the carbonate of calcium.

Property.—Some preparations are sedative, others are sedative and astringent. Lime water and chalk are astringent and alkaline.

Use.—Either freshly slacked lime or, better, chlorinated lime may be used as a disinfectant. Carron oil consists of linseed oil and lime water, and is useful in the treatment of burns. Prepared chalk on account of its soothing and astringent effects makes a very useful tooth powder.

Manner of Using.—For internal use lime may be given in the form of a syrup where its assimilation is desired. Lime water may be used as a spray, or it may be taken internally. Added to milk it prevents curdling.

CHLORINE (Chlorum).

Definition.—A gaseous element of a greenish color and strong suffocating odor.

Property.—Chlorine has the property of destroying the various forms of bacteria.

Use.—Chlorine is generated in the sick room and used in its free state as a disinfectant. For commodes, for bed-pans, or for internal administration a solution of chlorinated soda is employed.

Manner of Using.—Chlorine is to-day but little used internally, its principal use being external, and depending upon its power to kill germs.

COPPER (Cuprum).

Definition.—A metallic substance used to a slight extent in medicine, more widely in the arts.

Property.—Copper is astringent and caustic.

Use.—Its use is dependent upon its properties, it being an astringent and caustic. Copper is sometimes added to pickles to make them of a bright green color. This fraud can be detected by placing a piece of steel or the blade of a knife in the liquor; if it contains copper there will be a deposit of metallic copper upon the steel in a few minutes. The amount of copper present would not be sufficient to cause symptoms of poisoning. A far more dangerous source is the pigment found in wall-paper made of copper arsenite, which is very poisonous. This imparts to the wall paper its green color.

Manner of Using.—Copper should always be used with caution, and never without the advice or direction of a physician. When used internally a salt known as the sulphate is used. Externally its caustic action is effected.

GOLD (Aurum).

Definition.—A well-known precious metal. On account of its high place among the metals gold was supposed to have some special value in medicine. As a matter of fact it is but little employed.

Property.—Its chief property is to stimulate the glands of the stomach and liver. It acts also upon the kidneys, increasing the flow of urine.

Use.—It is used for its general stimulary effect on the system and for its stimulant effect on the liver and stomach in particular.

Manner of Using.—The preparation used is an orange-colored powder made of equal parts of sodium chloride or common table-salt and gold chloride. The dose for internal administration is minute.

HYDROCHLORIC ACID (Acidum Hydrochloricum).

Definition.—A metallic acid sometimes called muriatic acid or spirit of salt.

Property.—Dilute hydrochloric acid excites or stimulates the flow of secretions of the digestive tract and thus promotes appetite and digestion.

Use.—In dyspepsia due to insufficient amount of hydrochloric acid, the dilute acid is of value.

Manner of Using.—The dilute acid is used in drop doses freely diluted with water.

SODIUM (Sodium).

Definition.—A metallic substance not used in medicine except in combination.

Property.—One of the preparations or combinations sodium chloride is known to all as table salt, and plays an important part in digestion. Sodium sulphate is known as Glauber's salt and is a bad tasting and harsh cathartic. Some of the preparations, as the salicylate, reduce the alkalinity of the blood.

Use.—Table salt may be used in doses of a half to one tablespoonful as an emetic. The salicylates are used in rheumatism, and the preparation known as Glauber's salt is cathartic in its action. Sodium bicarbonate in powder or solution is applied to burned or scalded surfaces and quickly relieves pain.

Manner of Using.—Locally either the bicarbonate or its solution may be applied. Borax, which is the borate of sodium, is antiseptic in action. The other preparations mentioned above are taken internally.

IRON (Ferrum).

Definition.—The most useful, widely distributed and abundant of all the metals.

Property.—Being a normal or natural element of the blood, iron and its preparations have the property of building up the blood and tissue wornout by disease. Iron has also a tonic effect on the nerves.

Use.—In cases of anemia or lack of blood the various preparations of iron are employed to replace the loss. In convalescence from disease iron is of distinct value when given in small doses over a long period.

Manner of Using.—Locally the tincture of the chloride is astringent. Care must be taken whenever iron or its preparations are used locally about the throat or taken internally in liquid form that they do not come in contact with the teeth. Internally iron may be given in pill form or as a solution.

MAGNESIA.

Definition.—A metallic substance, four preparations of which are used generally in medicine.

Property.—Magnesia being an alkaline substance is antagonistic to acids. It is also laxative.

Use.—The laxative property is marked in the oxide of magnesia and in the sulphate of magnesia or epsom salt. The citrate is laxative. The oxide is a useful antacid.

Manner of Using.—The sulphate or epsom salt is readily soluble in water. A teaspoonful is sufficient for most people as a purgative, though a tablespoonful would do no harm. Magnesia can be used in doses as high as a teaspoonful to two teaspoonfuls for an adult. For young children the dose is ten to twenty grains. The citrate of magnesium is a pleasant purgative in liquor form.

MANGANESE (Manganum).

Definition.—A metallic substance, two preparations of which, the dioxide and the sulphate, are used in medicine.

Use.—Manganese is used in the same cases as iron.

MERCURY (Hydrargyrum).

Definition.—A heavy fluid, with a silvery lustre and free from odor or taste.

Property.—Mercury in small quantities acts as a tonic, improving the condition of the blood. It is sometimes called an alterative from the fact that it alters or changes the state of the system.

Use.—Its use is that of a tonic, but should always be used advisedly. The preparation called corrosive sublimate, which is the bichloride of mercury, has no equal as an antiseptic. Calomel and blue mass are valuable as laxatives.

Under the name quicksilver we recognize the mercury used in the arts, as to manufacture thermometers and mirrors.

Manner of Using.—Corrosive sublimate should be used only externally without a physician and with great caution, as it is very poisonous. Blue mass pill may be given as high as five grains. Calomel is best taken in small amounts, but this, too, should be used with caution.

NITRIC ACID (Acidum Nitricum).

Definition.—One of the metallic acids occurring as a colorless, fuming liquid.

Property.—Locally the application of nitric acid is followed by destruction of tissue. Taken internally it is an astringent.

Use.—The local effects are made use of in the employment of the acid as an escharotic. Internally it is used where astringent results are desired, as in diarrhœa.

Manner of Using.—The strong acid is used locally, but for internal use only small quantities are used and very well diluted.

OXYGEN (Oxygen).

Definition.—A gaseous element forming one-fifth of the atmosphere.

Use.—Being a vital part of the air we breathe it is used in diseases of the heart and lungs associated with great difficulty in breathing.

Manner of Using.—It is usually kept in tight cylinders ready for use. It is used by inhalation.

PHOSPHORUS (Phosphorus).

Definition.—A yellow wax-like substance obtained from bones. It has the odor of garlic.

Property.—Phosphorus acts upon the nervous system and upon the bones.

Use.—In disease of the bones, dependent upon defective nutrition, phosphorus is of great value. In those nervous diseases dependent upon nerve exhaustion, rather than organic disease, phosphorus is employed with benefit.

Manner of Using.—Phosphorus is given in the form of pills or as a liquid preparation. Poisonous effects quickly follow an over-dose.

SILVER (Argentum).

Definition.—Another of the precious metals. It is much more extensively used than the metal with which it is so often associated.

Property.—The preparation of silver that is most often used and the only one to be considered in this work is the nitrate of silver, or, as it is called, lunar caustic.

Locally and internally lunar caustic is astringent in its properties. The mark made externally is white, but this subsequently becomes black on exposure to light. Solutions of this substance behave in the same manner.

Use.—Locally the astringent or even caustic property of the drug are made use of in the destruction of exuberant granulations forming what is commonly called proud flesh. A solution of thirty grains to a pint of water painted on the finger will absorb a felon. Internally also the drug is used for its astringent action on the gastro-intestinal tract.

Manner of Using.—Internally minute doses are used. For external applications solutions are employed and are made of varying strength, depending upon the particular need.

SODIUM (Sodium).

Definition.—This element is not used by itself in medicine, but certain of its salts are well known and widely employed.

Property.—Sodium hydrate or caustic soda, as its name implies, is a caustic. Bicarbonate of soda is a sedative when used externally. Internally it is antagonistic to acids, hence is said to be antacid. Borax or sodium-borate is used internally, but is liable to disturb the stomach. It is sedative in its action. Sodium chloride or table-salt is an important part of our food. Sodium phosphate is mildly purgative in its action. Sodium sulphate or Glauber's salt is a powerful purgative.

Use.—Bicarbonate of soda is much used in dyspepsia. When given a few hours before meals it stimulates the flow of gastric juice. When given an hour or so after meals it serves to neutralize fatty acids which are products of faulty digestion. Sodium chloride in solution is much used to-day injected in the bowel or under the skin.

Manner of Using.—All the salts are soluble and should be taken internally in solution, in doses to meet the requirements of each case.

SULPHUR (Sulphur).

Definition.—A lemon yellow-colored substance, brittle, tasteless and without odor. It is found native in Sicily and Iceland in the neighborhood of extinct volcanoes.

Property.—Locally applied, sulphur is a stimulant to the skin and a parasiticide. Internally it acts favorably, so changing the nutrition of the person that it is called an alterative. This drug has long been famed as a medicine needed by the young in the spring time.

Use.—The preparation known as compound licorice powder is a mild laxative. In cases of disordered nutrition sulphur oftentimes acts most favorably. The fact that sulphur is absorbed into the blood from the small intestine is shown by the effect upon silver coins or jewelry work by persons taking it. This effect is to darken these articles. The effect or results is a beneficial one upon the blood, hence in cases where the blood is deranged or below par, sulphur is useful. In the various forms of skin disease, dependent upon parasites, sulphur is useful from the fact of its power or ability to destroy the parasite and stimulate the skin.

Manner of Using.—Internally sulphur is taken in solution. It may be taken in syrup or molasses. For external use it is best applied in ointment.

SULPHURIC ACID (Acidum Sulphuricum).

Definition.—A heavy oily liquid without odor, but with a strongly acid taste. It is sometimes called oil of vitriol.

Property.—Sulphuric acid is astringent and antiseptic when taken internally. Locally it acts as an escharotic.

Use.—Its properties indicate its use. It is an escharotic, internal antiseptic, astringent and tonic.

Manner of Using.—Sulphuric acid should be used well diluted and always advisedly taken.

PART II.

ORGANIC (VEGETABLE) MATERIALS.

The materials of this group are far more numerous than those of the preceding group. They will be found arranged according to their scientific names, the common names also being given.

ACETANILID (Acetanilidum).

Definition.—A white, crystalline substance, made from acetic acid.

Property.—It is sedative to the nervous system; causes a lowering of the temperature associated with free sweating.

Use.—It is employed in the treatment of spasms, for the relief of headache and to reduce temperature in mild cases of fever.

Manner of Using.—May be used as the powder or in the form of a tablet or capsule, five grains being the usual dose.

ACETIC ACID (Acidum Aceticum).

Definition.—A colorless liquid with a vinegar-like odor.

Property.—It checks hemorrhage locally, also has a soothing local effect. Taken internally it produces a cooling sensation.

Use.—It is useful as an antagonist to scurvy, as a refrigerant in mild cases of fever and locally for its soothing properties in sunburn. It acts also as a styptic.

Manner of Using.—The dilute acid is the safe preparation and may be used in amounts from one to two teaspoonfuls.

CARBOLIC ACID (Acidum Carbolicum).

Definition.—Carbolic acid is made from coal-tar. It occurs in the form of colorless crystals, but exposure quickly converts it into a colorless or slightly reddish liquid.

Property.—A slight fall in temperature follows the use of carbolic acid. Its chief action depends upon its property of destroying low forms of germ life.

Use.—By virtue of its properties it is used as an antiseptic and internally as an antiferment.

(Continued on page 815.)

MEDICINAL PLANTS.

PLATE I.

Saffron.—This plant is common in orchards and of a deep orange color. It is used as an infusion (tea); boiling one ounce of leaves in two pints of water. It is a pleasant home remedy in the beginning of scarlet fever, measles and chicken-pox, serving to bring out the eruptions. Dose, from half to a whole wineglassful, three times a day. It is also good as a gargle in sore throat.

Yellow Goat's Beard.—A tea of the root, bark and leaves of this plant is used for diarrhœa in children. Boil one ounce of root in two pints of water. Take two or three tablespoonfuls three or four times a day

Hedge Mustard.—Used cooked for table purposes as a stimulus to the stomach and to relieve coughing. Also used in the form of an infusion (tea) to cleanse ulcers and wounds. Boil an ounce of seeds, or a quantity of leaves, in a quart of water and wash the sore parts twice a day.

Common Hedge Nettle.—Made into a tea and drunk freely is excellent for hemorrhages of lungs and stomach. In doses of half a wineglassful four times a day it relieves neuralgia. A poultice of the leaves also relieves neuralgic pain and aids in the cure of wounds. Used at times as a tea, and drunk in wineglass doses twice a day, to promote menstruation and kill worms.

Saffron.

Yellow Goat's Beard.

Hedge-mustard

Common Hedge-nettle

PLATE 4.

MEDICINAL PLANTS.

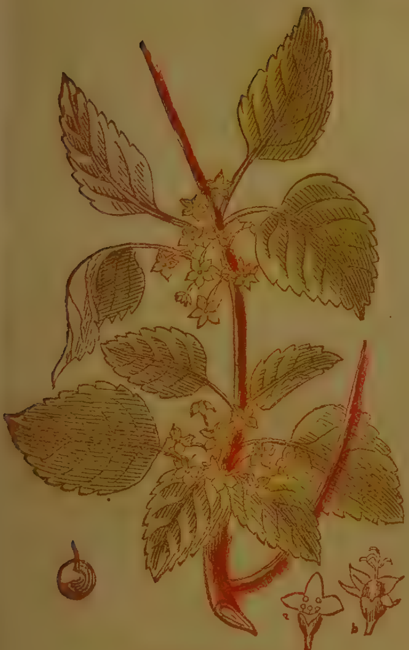
PLATE II.

Cathartic Ramno.—A tea of the bark, taken in tablespoonful doses, three times a day, opens the bowels. But caution is needed, lest it lead to purging.

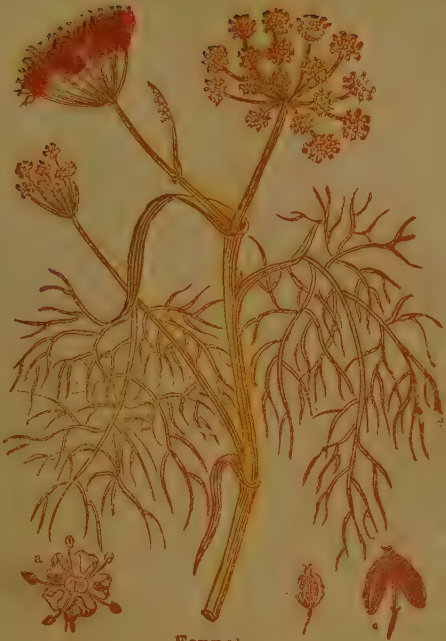
Fennel.—The seeds and leaves in the form of a strong infusion (tea) are excellent for colic. The seeds in the form of a powder are also good for cramps. Dose of the tea, a wineglassful, repeated at half-hour intervals, if necessary. Dose of the powdered seeds, ten to twenty grains.

Tansy.—Tansy tea in doses of a teacupful twice a day, promotes menstruation. In the form of bitters, it strengthens weakened constitutions. Cold tansy tea, drunk freely, is good for dyspepsia. An oil of the plant is supposed to produce abortion, but its use is very dangerous.

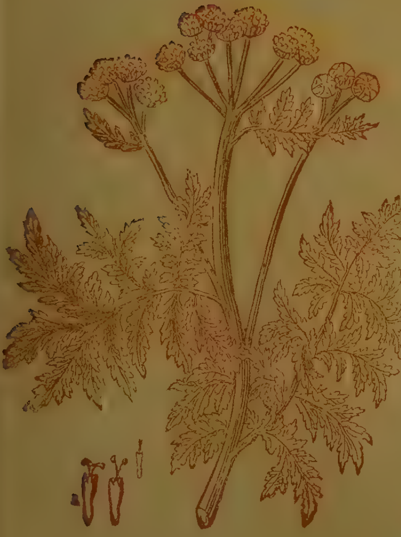
Wood Sorrel.—A poultice of the leaves was once a popular application in cases of cancer. Sorrel tea, drunk freely, also aids in giving relief to cancerous affections.



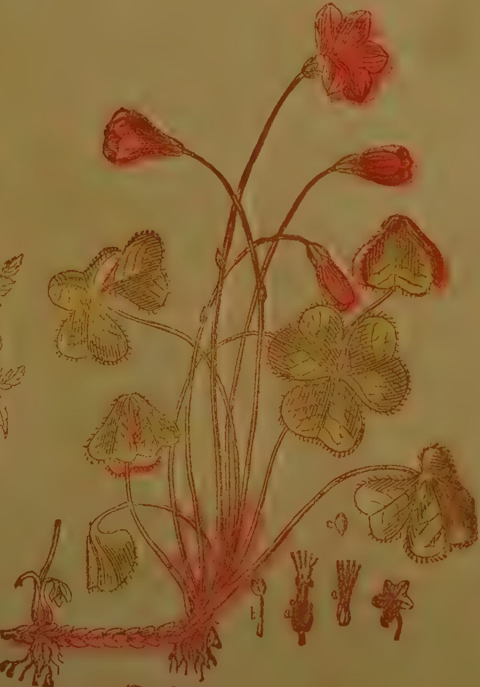
Cathartic Ramno



Fennel



Tansy.



Wood sorrel.

PLATE II.

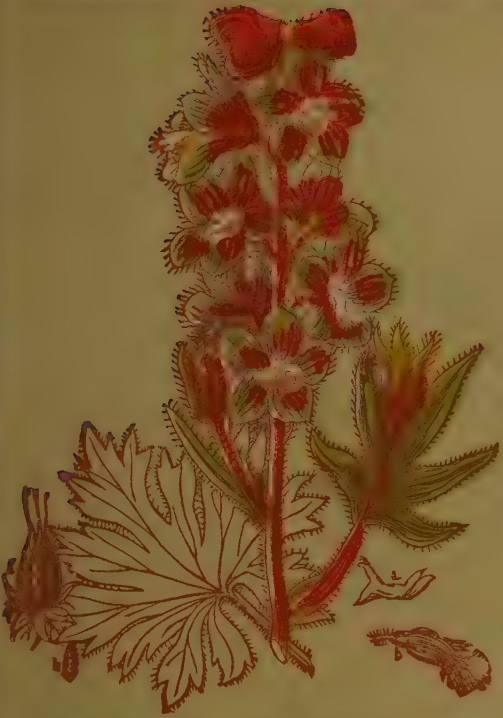
PLATE III.

Stavesacre or Lousewort.—The crushed seeds, made into a paste and rubbed on the head, is an effective way to kill lice.

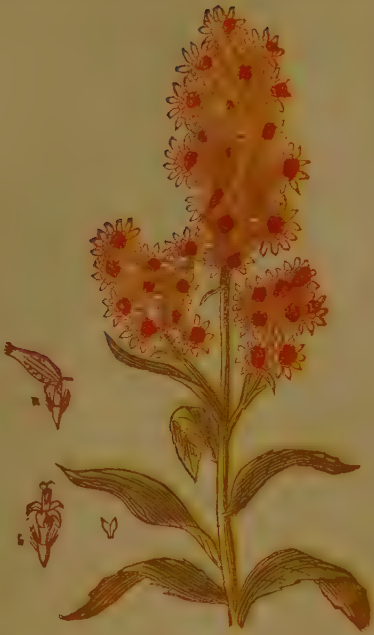
Golden Thistle.—A tea of one ounce of leaves or stems to two pints of water will relieve colic. Dose, a wineglassful, repeated every half-hour, if necessary.

Lime-Tree.—The juice of the lime, mixed with water, is a refreshing drink, in frequent sips, for fever sufferers. Lime juice in large quantities is carried on board ships as a preventive of scurvy.

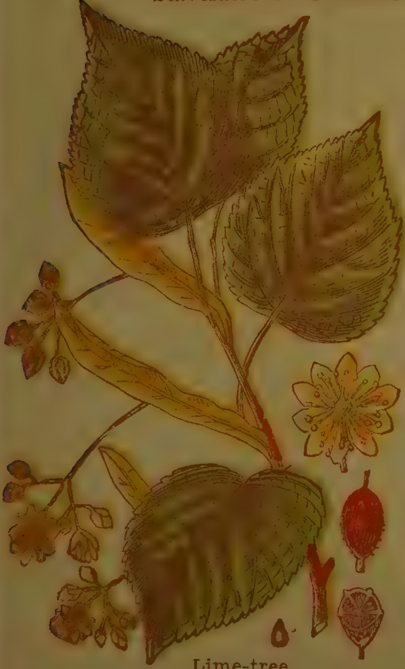
Red-Berried Trailing Arbutus.—A strong tea, made of one ounce of the leaves to a quart of water, and taken in doses of two tablespoonfuls three times a day, is used to relieve bladder trouble. It diminishes the irritation caused by the urine, and the inflammation and pain.



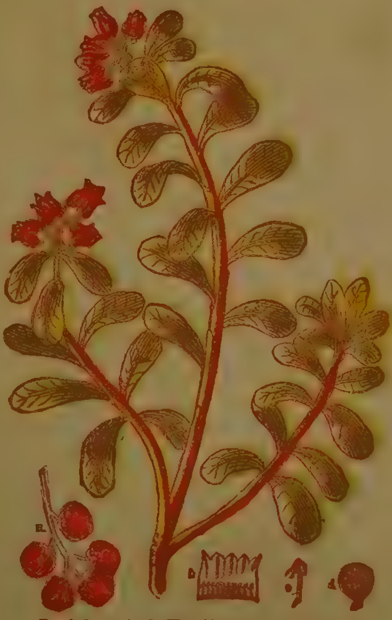
Stavesacre or Lousewort



Golden Thistle



Lime-tree



Red-berried Trailing Arbutus.

PLATE III.

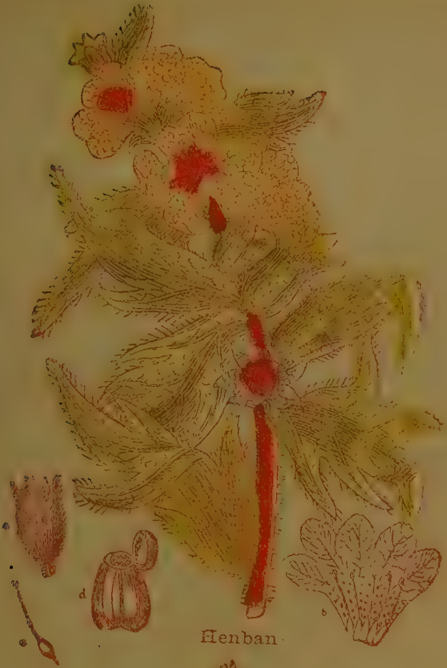
PLATE IV.

Henbane.—This plant, like belladonna, is a powerful poison. It is used in the form of an extract to soothe pain. Dose, one-eighth to one-half a grain once or twice a day. It is frequently used in cases of delirium, where opium cannot be used. Great caution is needed in its administration.

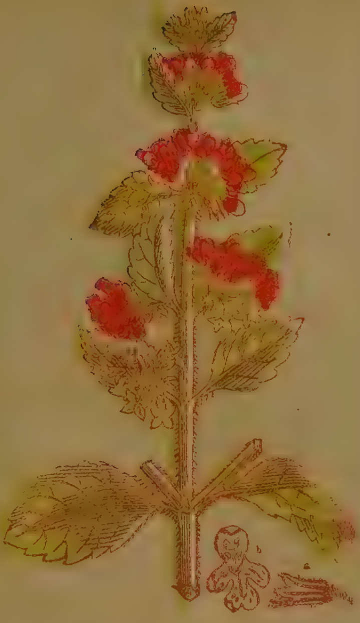
Mountain Balm or Calamint.—Make a tea of the root, dilute with water and sweeten. Give in teaspoonful doses at intervals of half an hour to relieve wind colic in children.

Sage or Salvia.—Sage tea, either alone or mixed with vinegar, honey or alum, is an excellent gargle for sore throats. Drank freely it cures night-sweats. Simmered in lard and taken four or five times a day in doses of two spoonfuls each cures quinsy.

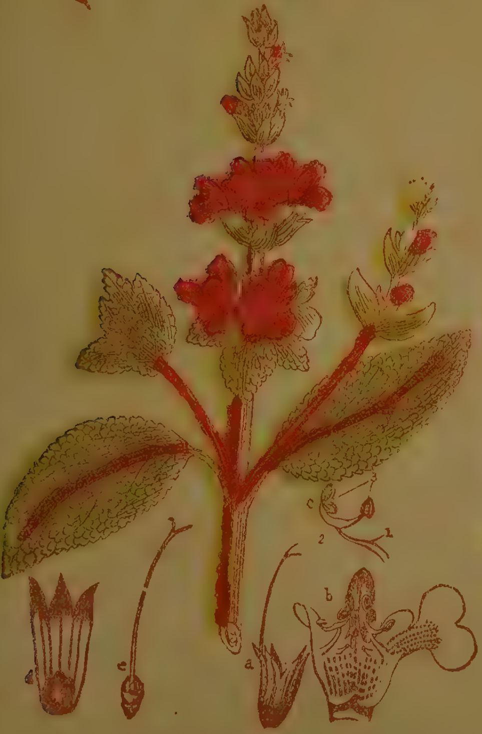
Mustard.—Powdered mustard seeds are used on the table and in medicine. One or two teaspoonfuls in a glass of hot water is used to provoke vomiting. If necessary, repeat the dose till the desired result is reached. Mustard in the form of plasters or poultices soothes pain and promotes circulation. Mustard seeds, in doses of a teaspoonful three times a day, relieve dyspepsia. Mustard plasters, applied to the extremities, serve to bring out again the eruption where it has gone in, in such cases as measles and scarlet fever.



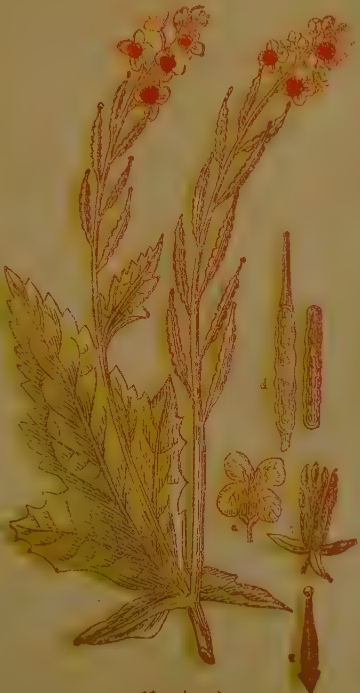
Henban



Mountain-balm or Calamint



Sage or Salvia.



Mustard.

PLATE IV

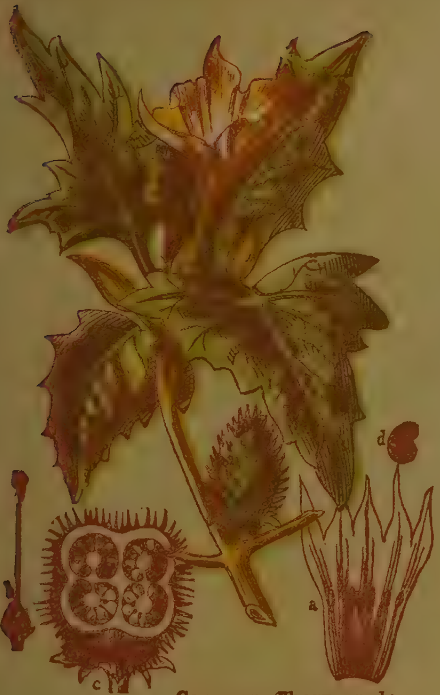
PLATE V.

Common Thorn-Apple.—This plant belongs to the same family as henbane and belladonna. Cigarettes made from the dried leaves, and smoked, are good to calm asthma difficulties.

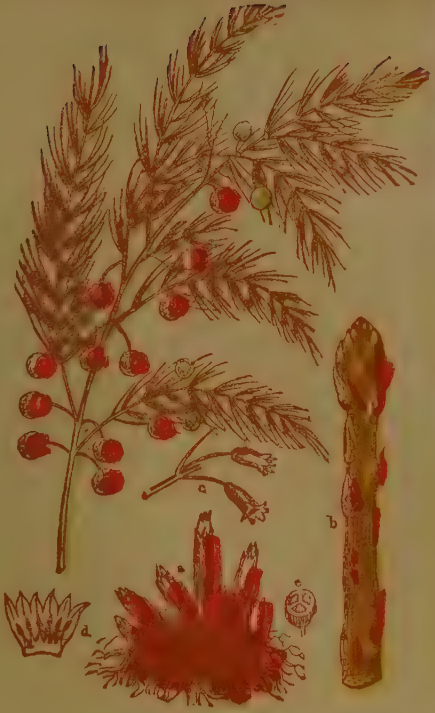
Asparagus.—Used as a table dish gently stimulates the kidneys. In the form of tea, drunk at three or four hour intervals, it promotes a free flow of urine.

Marshmallow.—The powdered root may be used as a poultice in cases of gangrene. A fresh infusion (tea), drunk freely, is of service in children's diseases, and especially in Bright's disease. Marshmallow drops are useful in sore throat, in scarlatina and diphtheria. The dose is indefinite. An infusion, drunk freely, is good for acute gonorrhea, and all affections of the mucous membrane of lungs and bowels, and inflammations of kidneys and bladder.

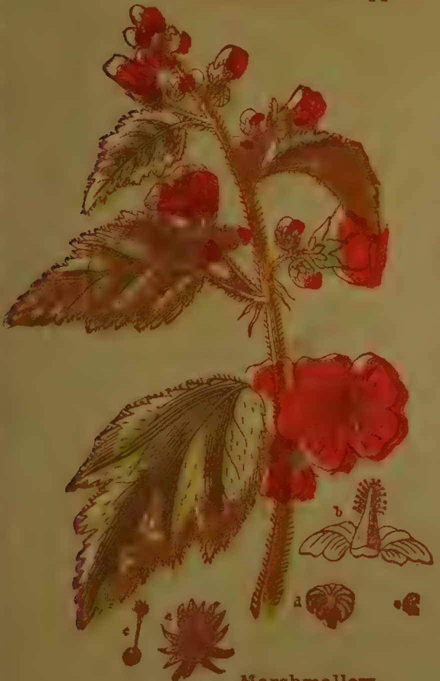
Hops.—The root, used as a powder or a pill, soothes the irritation of the urinary organs and the pains of gonorrhea. Infusion of hops, or hop tea, is made by taking a tablespoonful of hops to a pint of water and is given in doses of two to five ounces, twice to three times a day. In delirium tremens hop-tea quiets drink craving and settles the stomach. In insomnia and restlessness it is useful in producing sleep. A hop poultice gives relief in local painful affections. Or the hops may be placed in flannel and moistened with hot whiskey and applied to painful cases, as in toothache or earache, where the warmth and steam are very soothing. The inhalation of the vapor of hops is often attended with good results, especially in diseases of the throat and chest.



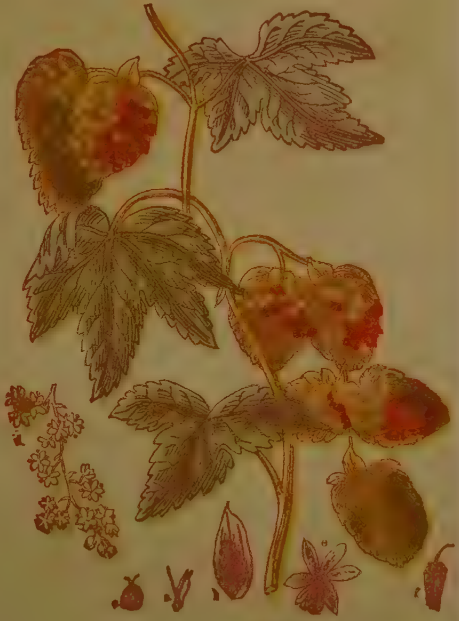
Common Thorn-apple.



Asparagus.



Marshmallow.



Hops.

PLATE V.

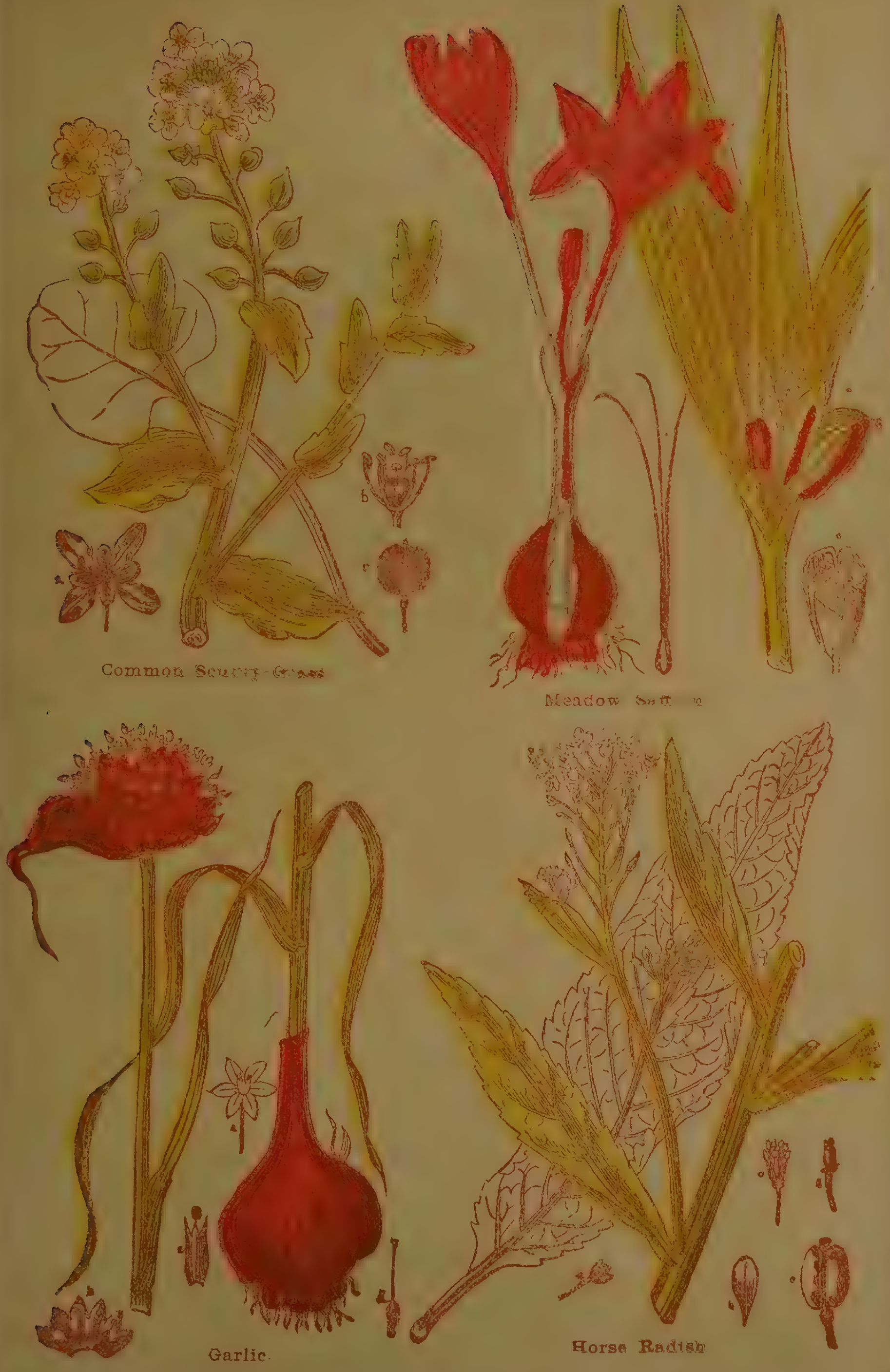
PLATE VI.

Common Scurvy-Grass.—This plant is popularly eaten as a salad and is useful in scurvy, chronic rheumatism and chronic malaria. The juice has been used externally for the purpose of stimulating indolent ulcers and, diluted with water, as a mouth-wash for spongy gums and ulcers of the mouth.

Meadow Saffron.—Saffron-tea, drunk freely, is used in domestic practice to bring out the eruption in measles and scarlet fever and to cause sweating. Externally it is used in bruises, rheumatic and neuralgic pains and in the form of ointment for bleeding piles.

Garlic.—Garlic, onion and leek are used in bronchitis and chronic cough. Here it can also be applied to the chest in the form of a poultice, or the oil can be used externally. A garlic poultice may also be successfully employed in convulsions and intestinal and stomach troubles of children. Garlic is also given for worms. It is a domestic remedy in whooping-cough. Syrup of garlic is given in doses of five drops to a teaspoonful, two to three times a day, or oftener, if the coughing spells are frequent and violent.

Horse-Radish.—Used as a tonic for the digestion, and to promote the secretion of the kidneys. Syrup of grated horse-radish and honey or sweetened water, taken in teaspoonful doses every hour, will cure hoarseness. Horse-radish tea, drunk freely, is beneficial in rheumatism and neuralgia.



Common Scurvy-Grass

Meadow Saffron

Garlic.

Horse Radish

PLATE VI.

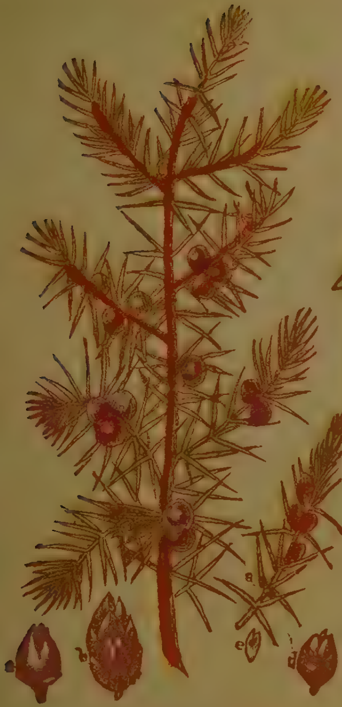
PLATE VII.

Common Juniper.—By boiling an ounce of the berries (pounded) in two pints of water an infusion is obtained which stimulates the action of the kidneys. A pint is drunk through the day in Bright's disease with its attendant dropsy. The juice of the berries has been successfully used in doses of two or three teaspoonfuls daily in children to promote the secretion of urine. The oil may be dropped in boiling water and inhaled to produce the same effect.

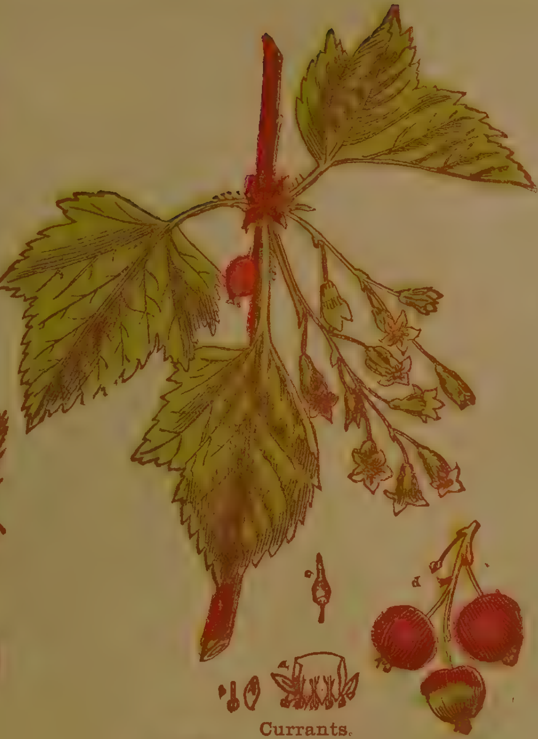
Currants.—The juice of the berry, boiled and sweetened, and in teaspoonful doses three to four times a day, is binding in infantile diarrhœa.

Common White Hoarhound.—The herb may be used in infusion (an ounce to a pint of water), taken hot and frequently in recent colds to produce sweating. The cold tea, drunk freely, is serviceable in chronic lung affections. Cough-drops are used for sore throat and cough.

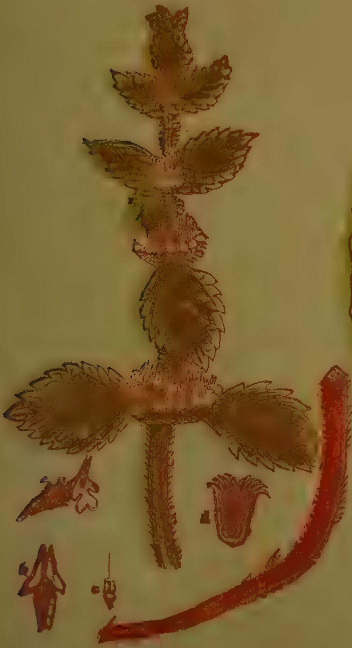
Colt's Foot.—The infusion of the dry leaves is used to soften the phlegm in chronic catarrh. It may be drunk freely.



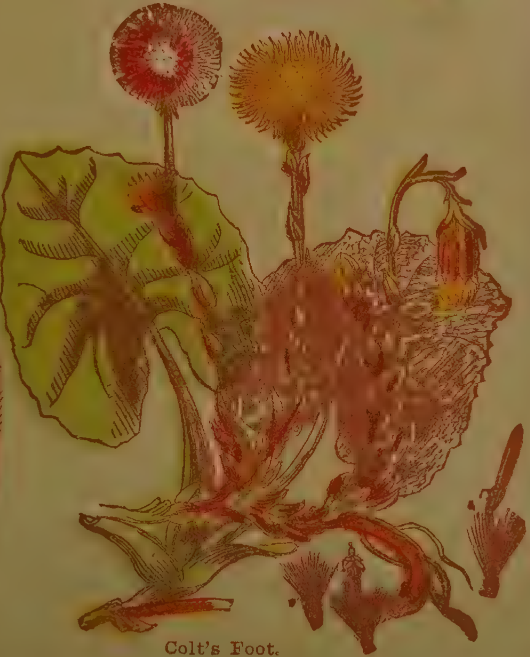
Common Juniper.



Currants.



Common White Hoarhound.



Colt's Foot.

PLATE VII.

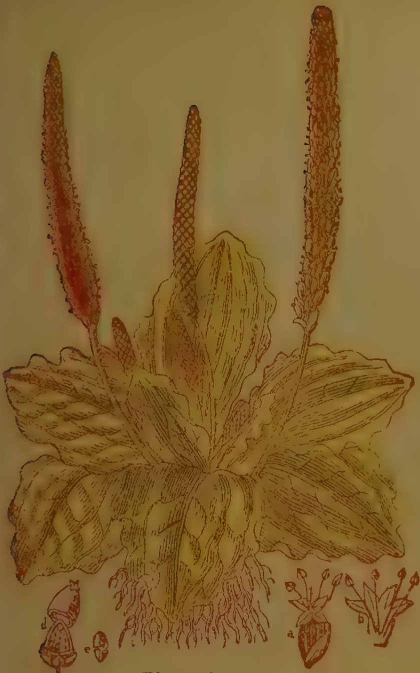
PLATE VIII.

Plantain.—The fresh leaves are pounded in a mortar into a paste and applied to wounds to check bleeding. In sumach poisoning, burns, scalds, bruises, and even erysipelas, it is said to be extremely useful.

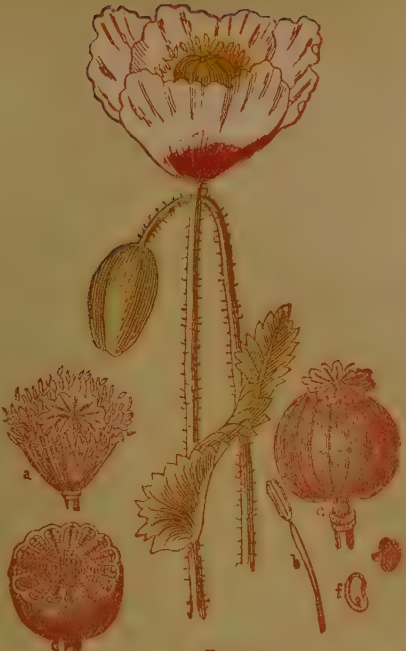
Poppy.—By cutting the unripe seed pod a milky fluid is obtained called opium. Powdered opium may be mixed into a paste with water and applied to a beginning boil with relief. Opium is used in medicine in many forms, as laudanum, morphine, paregoric, and so forth. It is given in various forms and quantities to relieve pain and irritation, to relax spasm, to produce sleep, to check secretions and to influence nutrition. It should be used with great caution.

Pennyroyal.—Pennyroyal tea, or a recent infusion of the leaves and tops, is used in flatulent colic and recent suppression of the menses. The infusion may be drunk in teacupful doses, several times a day. The fresh herb is said to be obnoxious to mosquitoes, and may be hung about the sleeping room, or the hands and face bathed with a recent infusion or a solution of the oil in alcohol (one to ten) in order to keep off these midnight marauders.

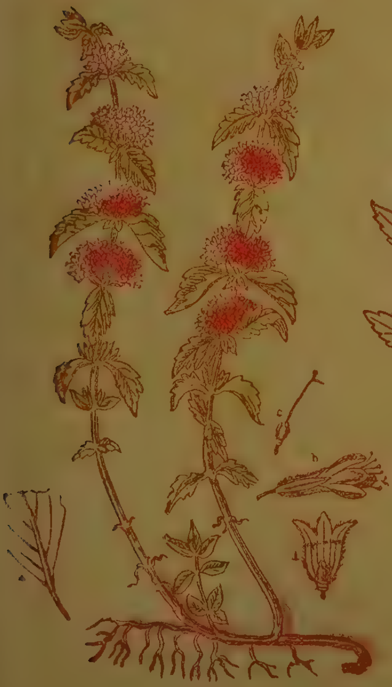
Hellebore.—This has been used by some to bring on the menstrual flow by purging, but is now very rarely employed. It causes vomiting and acts on the heart. It also destroys sensation when used locally. This medicine should be carefully used, as it is very poisonous. The dose is four to fifteen grains. A dose of the fluid extract of black hellebore, three to five drops three times a day, is used in dropsy, especially dropsy of the brain.



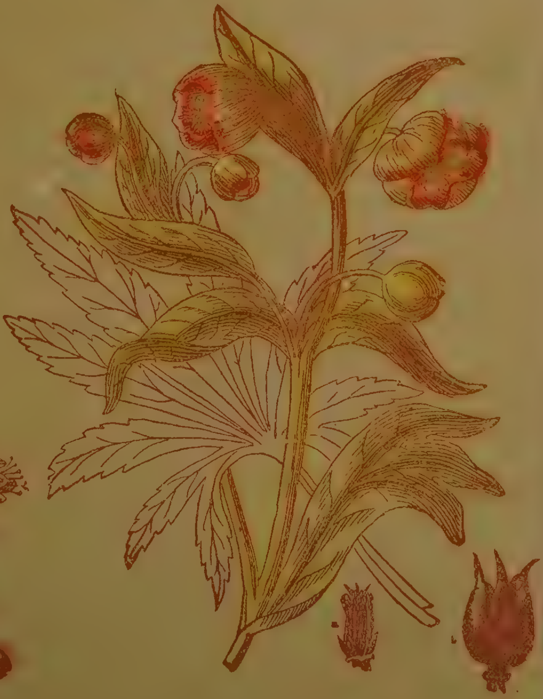
Plantain.



Poppy.



Pennyroyal



Hellebore.

PLATE VIII.

PLATE IX.

Peony.—An infusion is made by boiling one ounce of the powdered root in a pint of water. It is good in spasms, whooping-cough and nervous diseases. Dose, half a cup four times a day. Formerly it was considered as a tonic for the nerves and was given for epilepsy and St. Vitus' dance

Perforated St. John's Wort.—This plant is used as a tea to promote menstruation. It may be taken in wineglass doses, three to four times a day.

Wolf's Bane.—This drug, which is better known under the name of aconite, is very powerful and dangerous. It is given in the first periods of fevers and inflammations, such as pneumonia, erysipelas and rheumatism. A few drops of the tincture are mixed in a tumbler of water and a teaspoonful of this is given every ten, fifteen or twenty minutes. Asthma, especially in children, and preceded by cold in the head, is generally benefited by it. In the form of a liniment it is used in neuralgia. Extreme care must be taken in using wolf's bane.

Lily of the Valley.—In small doses this drug strengthens the heart; in larger quantities it quiets it. It quickly relieves the shortness of breath and palpitation in heart disease, and after having been given for two or three days may be stopped for a week or more without the symptoms returning. It increases the flow of urine and reduces dropsy. An infusion or tea is made by taking one part of the underground stem and rootlets to three parts of water. The dose of the infusion is a tablespoonful to a wineglassful two or three times a day.

Peony

Perforated St. John's Wort.

Wolf's Bane.

Lily of the Valley.

PLATE IX.

PLATE X.

Flax.—Ground flaxseed mixed with boiling water forms flaxseed poultice, which is spread at least half an inch in thickness upon muslin or flannel, and applied as hot as possible in order to relieve pain and congestion in peritonitis and in pneumonia, pleurisy, and so forth, as jacket poultices, renewed every two or three hours. Flaxseed poultices are also applied to boils and abscesses to abort them or to hasten their ripening.

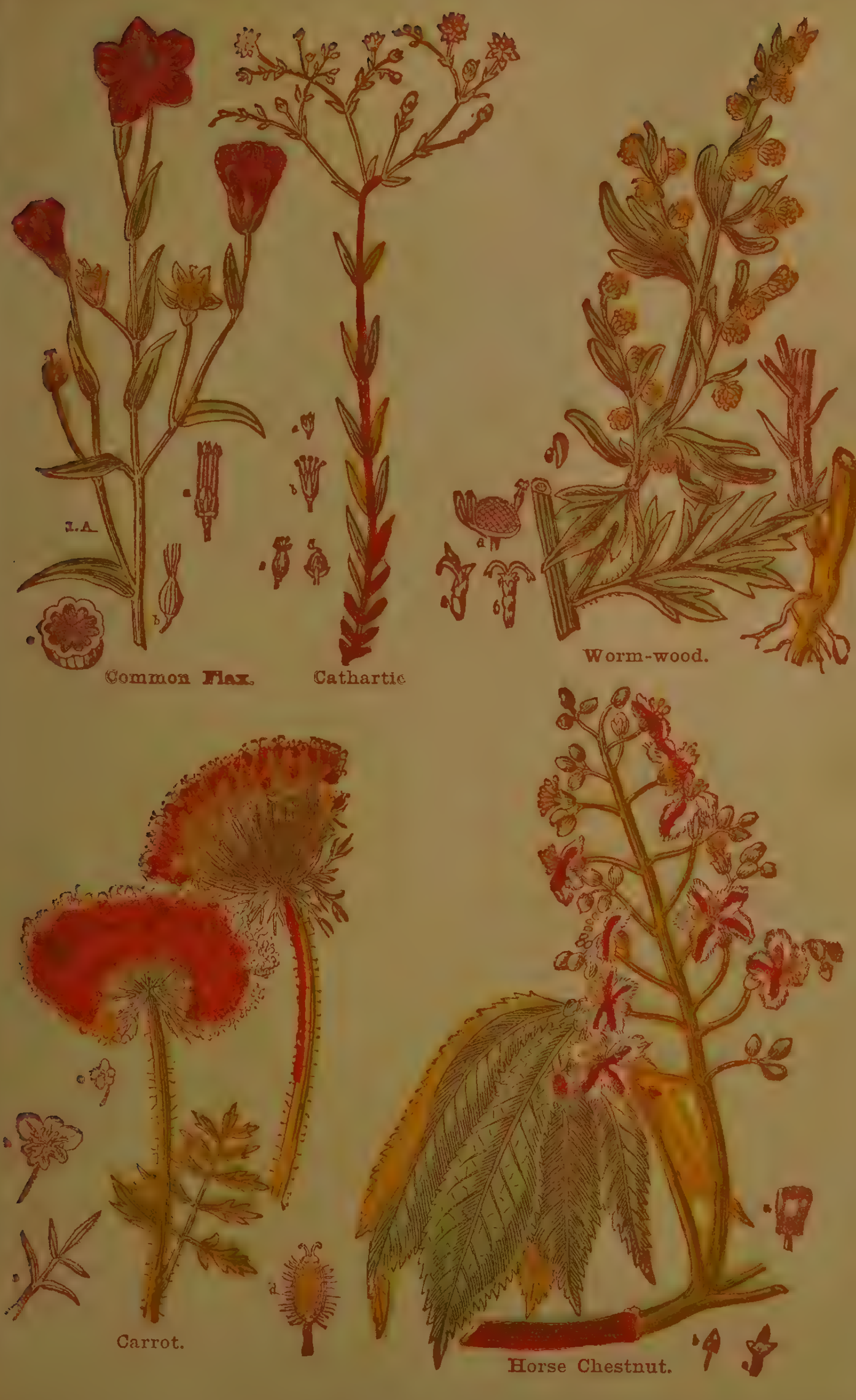
A hot infusion (a tablespoonful to a pint of water) flavored with licorice root or lemon peel is used in colds of the chest, to cause sweating and to loosen the cough. Flaxseed tea, drunk freely, is used as a soothing drink in inflammation of the stomach. Whole flaxseed, in tablespoonful doses, once or twice a day, has been ordered as a laxative in habitual constipation.

The oil of flaxseed, or linseed oil, is an old application to burns.

Wormwood.—An infusion is made with one or two teaspoonfuls of the plant to a pint of water, and in wineglassful doses is used as a tonic or for worms in children. It is a domestic remedy for flatulent dyspepsia and weak digestion. Dose, from one to four tablespoonfuls twice a day. Externally it has ben used as a stimulating application to indolent ulcers. A tincture, flavored with aromatics, forms an intoxicating drink called absinthe, used to a large extent in France.

Carrot.—The seeds are ground into powder and used to relieve colic and to increase the flow of urine. The dose is half a teaspoonful to a teaspoonful, twice daily. The root is said to be excellent for poultices. Carrot, used as a substitute for chewing tobacco, has been said to cure kidney complaint.

Horse Chestnut.—The bark is used, the best preparation being a fluid extract with dilute alcohol, although a decoction or tea is also employed. The dose of the fluid extract is twenty drops to a teaspoonful, three times a day. It is said to be a good substitute for quinine in malarial fevers and is also used in neuralgia. A dose of the tincture, three to five drops, three times a day, is a remedy for itching or burning piles.



Common Flax. Cathartic Worm-wood.

Carrot. Horse Chestnut.

PLATE X.

PLATE XI.

Licorice.—Licorice root is soothing to the throat, loosens cough and is laxative. Licorice is given for cough as Brown mixture and Wistar's cough lozenges. One to two teaspoonfuls of compound licorice powder is given daily in constipation, especially during pregnancy.

Iris (Straw Lily).—The powdered root, when fresh, produces vomiting and is a powerful cathartic; less so after drying. In chronic liver trouble, especially of malarial origin, the preparations of iris are very useful. In dropsy they are also of service in stimulating both the kidneys and bowels. They are also given for worms. The dose of the extract is a quarter of a grain to a grain, and of the fluid extract, half a teaspoonful to a teaspoonful, two to three times a day.

Dandelion.—The root should be gathered in the autumn. An infusion is made by taking two ounces of the fresh leaves or roots to a pint of water, the dose being two to four tablespoonfuls, two to three times a day. The preparations are bitter and probably stimulate digestion and act as a tonic. Dandelion is a laxative and increases the flow of urine. It is also prescribed for jaundice and for a sluggish liver. If the extract be used, the dose is from five to twenty grains three times a day.

Blackberry—Common Bramble.—The bark of the root is used. It is binding and tonic. It is used in diarrhœa, especially after cleansing the bowels with castor oil. The best preparation of the blackberry root is the fluid extract, given in doses of half a teaspoonful three or four times daily. The syrup and the spiced syrup, in the dose of a teaspoonful to a tablespoonful, are also used. Very popular preparations are blackberry cordial and blackberry brandy, of which a teaspoonful to a tablespoonful is taken, three or four times a day. Blackberry tea is valuable as an enema in leucorrhea, gleet and falling of the womb.

Licorice.

Iris (Straw Lily).

Dandelion.

Common Bramble.

PLATE XI.

PLATE XII.

Great Mullein.—This plant grows by the roadside and in neglected fields. It is given for catarrh, coughs, dysentery and piles in the form of an infusion made with milk, four ounces of the fresh, or a corresponding quantity of the dry leaves, being boiled for ten minutes in a pint of fresh milk. This quantity is to be drunk thrice daily, while still warm. It has long enjoyed a popular repute in Ireland as a remedy in diseases of the lungs. It has likewise been used in diarrhœa and inflammation of the bladder.

The flowers are said to remove warts. They are applied, while fresh, by pressing and rubbing upon the growth.

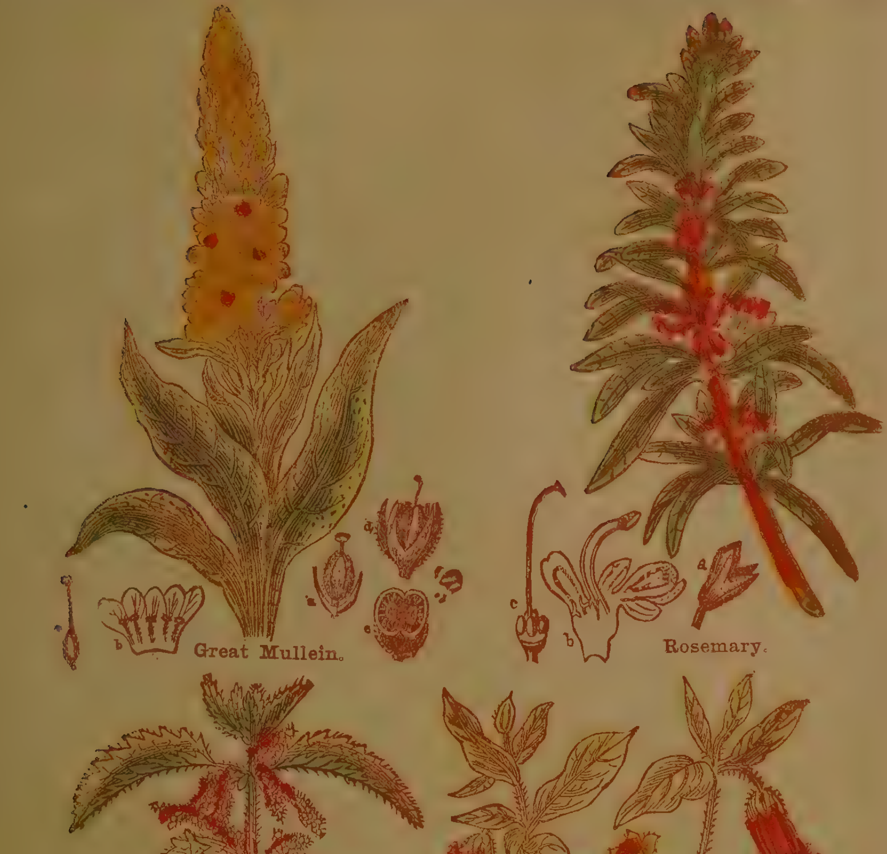
Rosemary.—From one and one-half to three teaspoonfuls of the plant, dried and powdered, taken as an infusion (tea), are said to produce decided sweating. The oil of rosemary is used in hair lotions and in an ointment used in neuralgia, chronic rheumatism and lumbago.

Nettle.—The juice of the nettle, in teasponful doses every hour, is of great value in cases of hemorrhage of the nose, lungs, intestines and urinary organs. The decoction may be made either with the seeds or with the leaves, and, drunk freely, is excellent for diarrhœa and dysentery.

Belladonna.—The fleshy, creeping root is especially useful, but must be taken from plants at least three years old. The leaves of belladonna or deadly night-shade are also used, the smaller leaves gathered when the plant is in flower being best.

Locally, belladonna is used as an ointment or liniment in neuralgia, chronic rheumatism; also to check sweating and relieve local pain. Internally, it is used chiefly to relieve pain, relax spasm and check oversecretion or bad discharge.

Its power of widening the pupil is used in treating the eye. In giving this dangerous drug the eye should be carefully watched. The dose of the tincture is five to twenty drops, once or twice a day, in cases of neuralgia, spasms and other nervous affections. Great caution is required, as the medicine is a poison.



Great Mullein.

Rosemary.

Nettle.

Belladonna.

PLATE XII.

PLATE XIII.

Parsley.—A hot infusion is made by taking an ounce of the fresh root to a pint of water. One to four teaspoonfuls, given three times daily, in cases of scanty menstruation will relieve pain. It is used to increase the secretion of urine in dropsy and gonorrhea, in the form of a decoction, drunk freely.

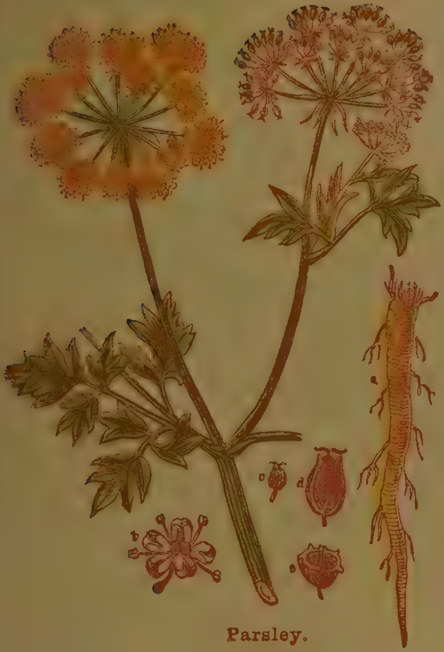
Valerian.—The underground stem and roots are used. It is given in the nervous disorders of women, especially nervous headache and hysteria. The various nervous disorders which occur at the changes are relieved by it. In convulsion or St. Vitus' dance in children, due to worms, and in whooping-cough it has been used with success. One to two teaspoonfuls of the tincture is given, three times daily.

Digitalis or Foxglove.—The leaves are gathered from plants of the second year's growth and must be carefully selected. An infusion is made by taking one and one-half parts to one hundred parts of water.

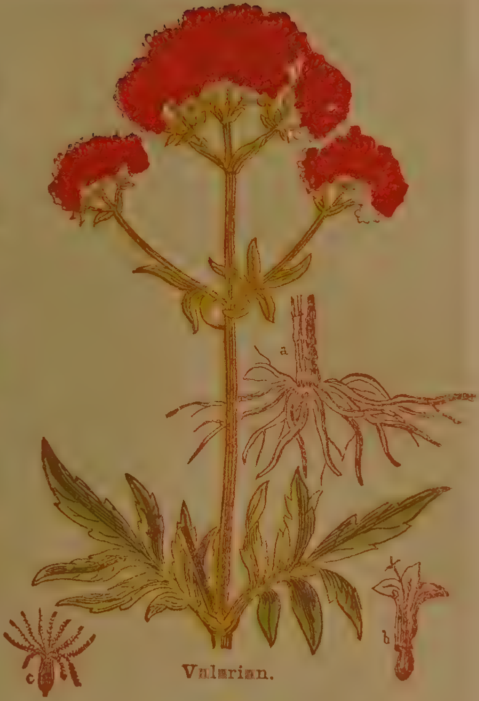
Locally, digitalis is used in joint inflammation. A poultice containing a teaspoonful or two of the leaves is placed over the kidneys in cases of difficult or impossible urination.

Its chief internal use is in heart disease, although it is often given for bleeding. The dose of the infusion is a teaspoonful to a tablespoonful, three or four times a day.

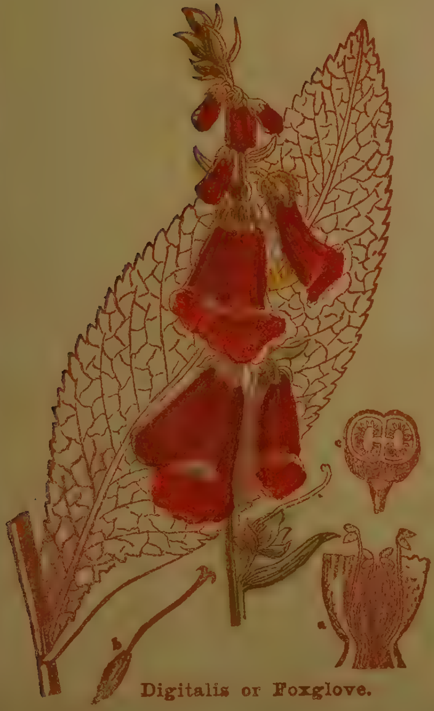
Crow-Foot.—The buttercup plant is sometimes used externally in cases of rheumatism. As it belongs to a very poisonous species, it should be used carefully and only on the prescription of a physician.



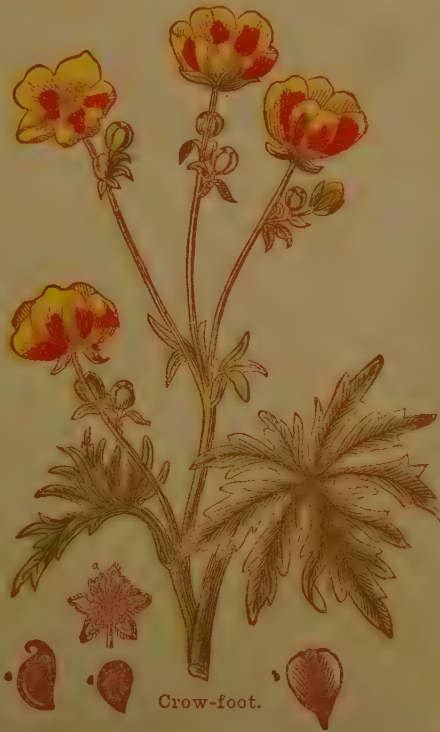
Parsley.



Valerian.



Digitalis or Foxglove.



Crow-foot.

PLATE XIII.

PLATE XIV.

Hemlock.—The full-grown fruit is gathered while yet green. Conium juice is expressed from the fresh leaves, and has half its quantity of alcohol added to it to preserve it. This is given in doses of half a teaspoonful to two teaspoonfuls. The seeds are used in making most preparations. Internally it is sometimes used in nervous affections, but it is a dangerous poison and should be used cautiously.

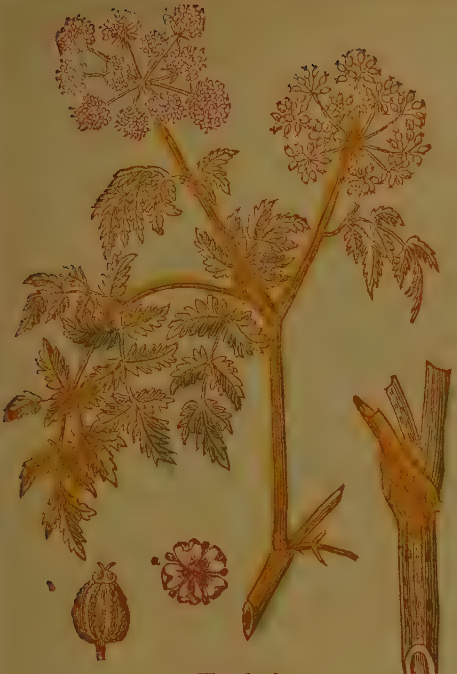
Poultices of the leaves of hemlock and flaxseed (two parts of the former to six of the latter) with boiling water, have been used as a soothing dressing to painful swellings. A hemlock ointment is made by bruising the leaves with sufficient water and extracting and mixing the juice with lard, and is an excellent local remedy in painful maladies.

Barberries.—The bark of the root has been made into an infusion, but the fluid extract in ten to thirty drop doses is most used. In this form the drug is tonic and stimulates the kidneys. It is valuable in the treatment of blood diseases, dyspepsia, liver trouble, habitual constipation and skin disease. The tea of the bark may be taken in doses of three to four teaspoonfuls, three times a day.

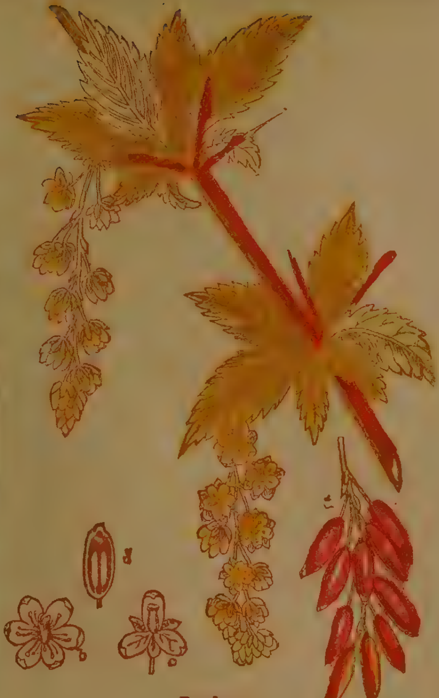
Elder.—One to two teaspoonfuls of an infusion of the flower, drank while hot, increases the flow of urine and causes sweating. It may cause vomiting, if given in too large a quantity. The flowers are edible, and are used in scurvy, rheumatism and syphilis. Elderberry jam is laxative.

A decoction is made of the inner bark, which acts on the kidneys and intestines. One or two teaspoonfuls, two to three times a day, is the dose.

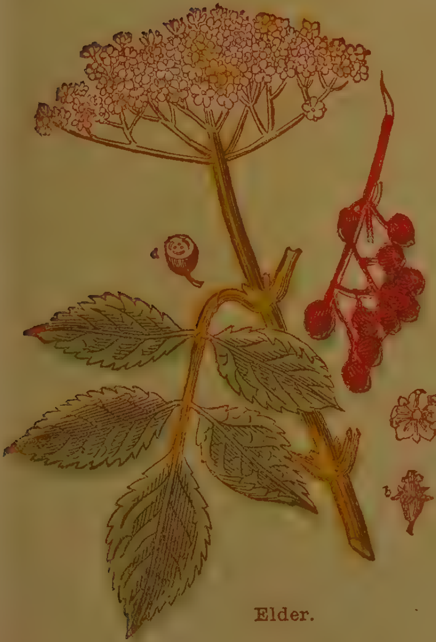
Oak-Tree.—A decoction is made of one ounce of the bark to a pint of water and given in doses of half a teaspoonful to a teaspoonful three times daily, for dysentery and diarrhœa. It is occasionally used as an injection or wash in leucorrhea; also as a gargle in sore throat and catarrh. The powdered bark is used on ulcers. The oak yields tannic acid, in which form it is used as an astringent enema in gonorrhea, gleet and leucorrhea.



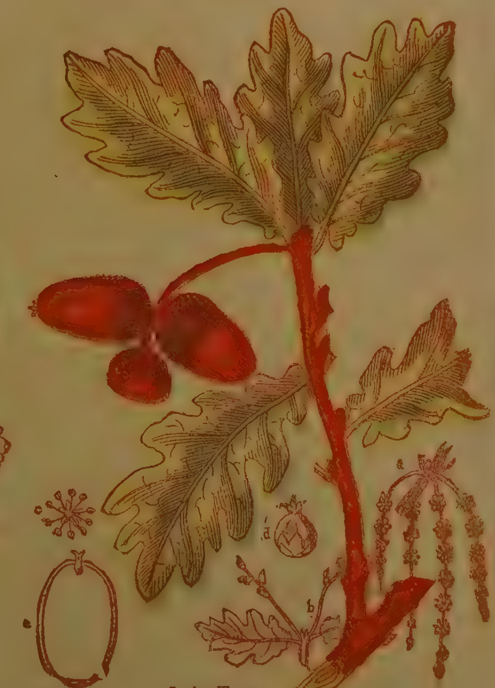
Hemlock.



Barberry.



Elder.



Oak Tree.

PLATE XIV.

PLATE XV.

Bitter-Sweet Nightshade.—A decoction is made by boiling an ounce of the young branches in a pint of water and given in doses of a teaspoonful to a wineglassful two or three times daily, for jaundice, rheumatism and syphilitic affections. It is believed to be of use in long-standing scaly eruptions. The fresh decoction, drunk freely, is used to produce sweating in rheumatism or acute bronchitis and colds. It is also beneficial in the diarrhœas of children when caused by exposure to cold or damp. The dosage should be small and cautiously given.

Common Chamomile.—The infusion is made with a tablespoonful of the flower heads to a pint of water and is taken freely. In large doses the hot infusion causes vomiting, but in one or two ounce doses it relieves gas in the stomach, favors perspiration and the action of the kidneys. Locally, it may be used as a poultice. It is used principally in domestic practice in the treatment of colds, bronchitis and dyspepsia, and is taken in the form of an infusion in doses of from two to three tablespoonfuls, two or three times daily.

Caraway-Seed.—An oil is made from the fruit and used in doses of one to five drops, two or three times a day, for distention of the abdomen due to gas. It is combined with other medicines to lend a pleasant flavor and to prevent griping.

Geranium.—A decoction can be made from the underground stem. It improves the appetite and digestion and promotes nutrition. It is used to stop bleeding. As an injection it is serviceable in gonorrhea, gleet and leucorrhea. In diarrhœa in children the decoction may be given in milk, which covers its taste. Dose, one-fourth to one-half teaspoonful, five or six times a day.

Bitter-sweet Nightshade

Common Chamomile.

Caraway-seed

Geranium

PLATE XV.

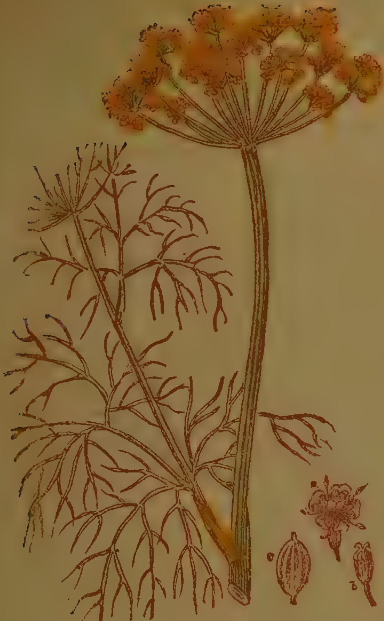
PLATE XVI.

Common Dill.—The fruit of this plant is warming, stimulating and quiets nervousness. A tea of the plant, in teaspoonful doses, is used in children's colic to relieve the hiccoughs. Occasional use of the decoction by mothers is thought to promote the secretion of milk.

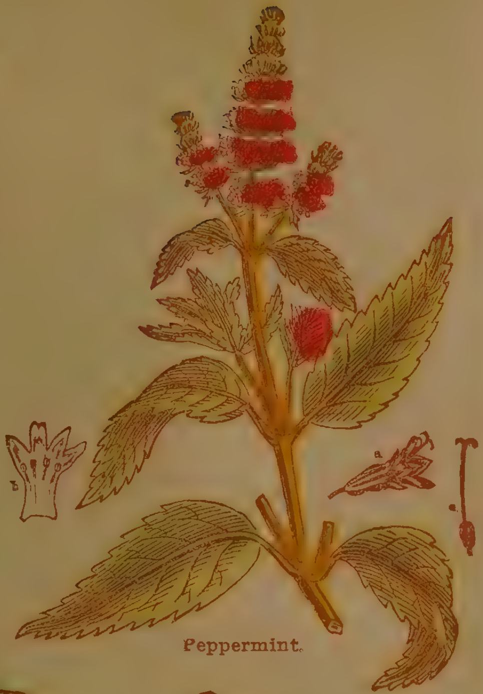
Peppermint.—Peppermint water is given in doses of a teaspoonful to a wineglassful; oil of peppermint, one to five drops, and spirits of peppermint, ten drops to a teaspoonful. In neuralgia oil of peppermint may be painted over the painful spot. It may also be used for rheumatism and chronic gout. In the colic of children the spirits of peppermint in hot water is a good household remedy. A warm infusion of mint, taken frequently in teaspoonful doses, is useful for the pains caused by gases in the intestines. A cloth, saturated in a teacup of water to which a teaspoonful of essence of peppermint has been added, applied to head and temples, gives relief from headache.

Mezereon (Laurel).—An ointment is made from the fluid extract of the bark (twenty-five parts), lard (eighty parts) and yellow wax (twelve parts). This ointment is used as an irritant to keep up discharges from ulcers and blistered surfaces. Mezereon bark has been successfully used to relieve toothache.

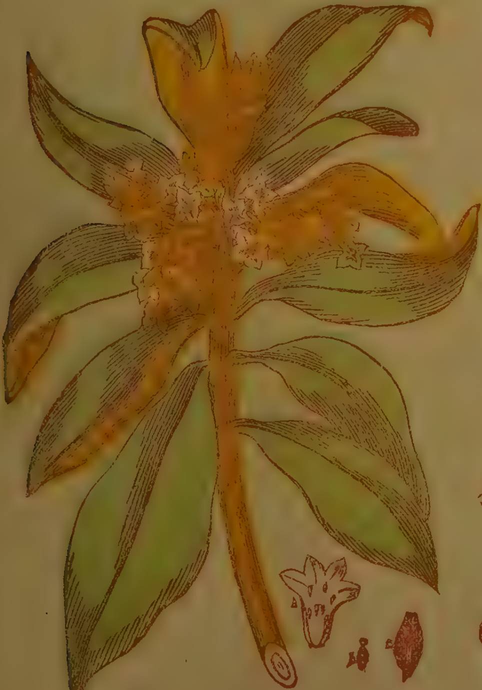
Common Black Briony.—The root is dried, and half an ounce of it with a pint of boiling water made into an infusion, which is given in doses of a wineglassful three or four times a day. It may be given for dropsy and inflammation of the joints. It is an active purgative, causing large, watery stools.



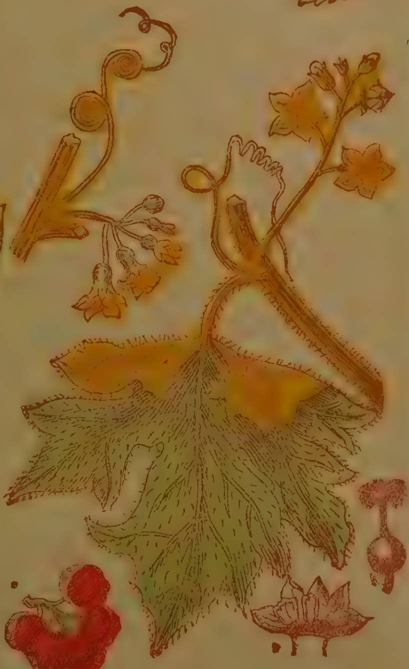
Common Dill



Peppermint.



Kalmia Latifolia. (Laurel.)



Common Black Briony

PLATE XVI.

Herbs, Roots and Plants
VALUABLE IN MEDICINE.

How and Where to Gather and Preserve
Them—Their Uses.

TOMATO. Cure for Cholera Infantum.

See index.

NAVY BEAN. Cure for Erysipelas.

See index.

AGUE ROOT. Treatment for Impotence.

See index.

CELERY. Treatment for Rheumatism.

See index.

STONE-ROOT. Cure for Piles.

See index.

GRAPE VINE. Cure for Dysentery.

See index.

GARDEN BEET. Cure for Delayed Menstruation.

See index.

CAYENNE PEPPER. La Grippe. Scarlet Fever.

See index.

LEMON. Treatment for twenty-seven diseases.

See index.

CHITTIM BARK. Constipation.

See index.

OREGON WILD GRAPE. Cure for Leucorrhea.

See index.

PUMPKIN. Cure for Tape Worm.

See index.

COMMON RUSH (*Jurcus Effusis*).

A positive cure for incontinence of urine (wetting the bed) in children. See index.

SANMETTO. SANTAL WOOD.

Gonorrhea. This simple plant remedy is a sure and speedy cure. See index.

SUCCUS ALTERANS.

The remedy discovered by Dr. J. McDade, of Montgomery, Ala., has revolutionized the world in the treatment of all venereal diseases. A quick, harmless and sure cure is now assured.

See index.

(Continued from page 781.)

Manner of Using.—Two or three drops may be taken internally, best given with a powder of bismuth. Locally it is used in solutions of various strength, the usual being 5 per cent.

CITRIC ACID (Acidum Citricum).

Definition.—Citric acid occurs in the form of colorless crystals. It is obtained from lemon or lime juice and has a sour taste.

Property.—It acts favorably upon the liver in cases of inactivity. By stimulating the glandular secretion of the intestinal tract it improves digestion and nutrition.

Use.—The use of citric acid in the treatment of scurvy is well known and cannot be superseded by any remedy at present under our command, except fresh lemon juice itself. In fevers a drink make of citric acid is very grateful.

Manner of Using.—The best form for administration is the syrup of citric acid, which may be given in doses from a teaspoonful to a tablespoonful.

GALLIC ACID (Acidum Gallicum).

Definition.—Gallic acid may be obtained from tannic acid, which is found in the galls upon the oak tree. These galls or nodes are lumps caused by insects. Gallic acid is in the form of long needles.

Property.—Gallic acid, like tannic acid, is astringent, but not so powerful as tannic acid.

Manner of Using.—When prompt action is desired it should be used in powder It is given also in other forms, such as pills, and so forth.

LACTIC ACID (Acidum Lacticum).

Definition.—Lactic acid is a colorless syrupy liquid having an acid taste. It is obtained from sour milk.

Use.—As this acid is found in the stomach during the first part of digestion, changes in the amount present cause forms of dyspepsia. When in excess or when it is absent dyspepsia in one form results. Its use in cases of deficiency added to that of pepsin, is followed by beneficial results. Locally it is a mild caustic, and is applied to warts and ulcers, by rubbing it on, with the intent of destroying them.

TANNIC ACID (Acidum Tannicum).

Definition.—Tannic acid occurs in the form of pale yellow scales.

Use.—The chief effect of tannic acid is that of an astringent contracting the tissues and checking secretion. It is used as a chemical antidote in cases of poisoning.

Manner of Using.—As an antidote it is used in powder form, twenty grains being the amount usually given.

TARTARIC ACID (Acidum Tartaricum).

Definition.—Tartaric acid appears as colorless crystals. It is obtained by the decomposition of cream of tartar found in old wine casks.

Use.—This acid is one of the constituents of a Seidlitz powder, which is laxative in its effect. Rochelle salt, also laxative, is potassium and sodium tartrate.

Manner of Using.—The acid or its salts are used in solution in quantities to suit.

ACONITE, MONKSHOOD (Aconitum).

Definition.—Aconite is the root of a plant growing in Europe. The root is conical in shape, two or three inches long, and closely resembles horseradish. When slowly chewed it produces a sensation of warmth slowly followed by numbness.

Use.—Aconite is sedative in its effects, and in accordance with this property it is employed locally in neuralgia. It is used also in cases of vomiting. Its principal action is upon the circulation, its effect being to slow the pulse.

Manner of Using.—The tincture of aconite is the preparation usually taken internally. The dose is very small, and even then poisonous symptoms are prone to develop.

LARD (Adeps).

Definition.—Lard is prepared from the fat of the abdomen of the hog. It is washed with water, melted and strained.

Use.—Care must be taken that the lard used does not become rancid. By the addition of benzoin the lard is prevented from undergoing this change. As an application for burns lard may be used as follows: Wash the lard, beat up with an equal quantity of lime water, and add a few drops of oil of bitter almond or carbolic acid. Lard softens and removes scabs.

Manner of Using.—For medicinal purposes the form of lard used is known as benzoinated lard.

ETHER (Æther).

Definition.—Ether is a clear, colorless liquid having its own peculiar odor and a sweetish taste. It is very inflammable, and its vapor mixed with air and ignited explodes.

Use.—When ether is poured upon the skin it produces a sensation of cold from its rapid evaporation. The part may be frozen and at this time a small operation, such as the opening of an abscess, may be performed. Taken internally ether is a stimulant to the heart. Its well-known effects in surgery, producing the state known as anesthesia, depend upon the action of the drug upon the brain and spinal cord. It was first used in surgery by Dr. Warren in 1846 at the Massachusetts General Hospital.

Manner of Using.—To produce loss of consciousness the vapor is inhaled, administered with safety only by a physician. For local use the vapor is locally applied.

ALCOHOL, SPIRIT OF WINE (Alcohol).

Definition.—Alcohol is a transparent, colorless liquid obtained from the distillation of fermented saccharine material. For use in medicine, whiskey should be at least two years old and wine at least four years old. Wine is made by fermentation without distillation. Red wine differs from white wine in that in the production of the former the skins of the grape are used. Malt liquors—ale, beer, porter, are produced by fermentation of malt and hops and contain nutritive material.

Use.—When taken internally in small amounts and at meal-time the effect of alcohol is to stimulate the glands of the stomach to greater secretion. The presence of alcohol in the stomach, however, retards digestion, so that if much be taken it is a detriment rather than an advantage.

As a result of the long-continued use of alcohol changes take place in the coats of the stomach. The inner lining of the stomach loses its delicacy and becomes thickened. It can no longer secrete as formerly, and indigestion results. Upon the heart and circulation alcohol is a decided stimulant. It strengthens the heart, it enlarges or dilates the blood-vessels and hence the flushed face of the one addicted to alcohol. Alcohol by its stimulant action enables the system to pass through great strains, but if its use is prolonged beyond the period of actual need it is followed by its harmful effects. These latter manifest themselves by changes in the stomach, liver and kidneys and blood-vessels, and consist essentially of a hardening of these organs, rendering their functions imperfect. Alcohol does not increase the heat of the body, as some suppose. By actual experiment it is found that by dilatation of the capillaries it leads to a loss of heat. It is found, for instance, that those explorers in the Arctic region who avoid alcohol can better endure the trials of those regions than those who indulge.

Manner of Using.—A discussion of this portion scarcely seems necessary. Much depends upon the person. There are many persons who cannot take even the malt liquors, which contain but from three to five per cent. of alcohol. On the other hand, we have abundant examples of men who have indulged in alcohol and yet whose health seems not to be greatly impaired by such indulgence. From the physical standpoint alone it may be said that people, especially young people, do not need alcohol in any form. Their system does not require it. In disease its benefits are undoubted, and, it may be added, are greatest to those to whose system it is a stranger.

STAR GRASS, COLIC ROOT (Aletris).

Definition.—Aletris is a plant the leaves of which spread upon the ground in the form of a star. The root is medicinal.

Use.—In small amounts it acts as a bitter tonic, improving the appetite and opening the bowels. It is useful in colic; hence one of its names, colic root.

Manner of Using.—The powder may be used as a powder or it may be taken in solution.

GARLIC (Allium).

(See Plate VI.)

Definition.—Garlic is the dried bulb of the allium sativum, a native of Asia and Egypt, but now naturalized in Europe and America. It resembles the onion and leek.

Use.—When added to a cough mixture garlic aids in the expectoration of secretion. For this latter purpose it is especially valuable in the case of children. Taken internally it is also a remedy against scurvy, hence called an antiscorbutic. Applied locally in the form of a poultice to the abdomen it relieves infantile intestinal colic.

Manner of Using.—The odor is quite offensive, and some will prefer other measures on this account. The preparation for internal use is known as the syrup of garlic, which may be used in a dose from ten drops to a teaspoonful.

ONION (Allium Cepa).

Definition.—The onion represents a bulb and is cultivated everywhere.

Use.—In small quantity onion promotes digestion, but experiments by Pilacki and Popoff seem to show that large quantities are harmful by neutralizing the gastric juice. Onions act beneficially upon the liver, increasing the secretion of the bile. Like garlic, it acts as an antiscorbutic.

Manner of Using.—For internal use, as in colds and croups, a syrup is employed, of which from one to four teaspoonfuls may be taken.

ALOES (Aloe).

Use.—The dry juice is medicinal and one of the best laxatives for promoting and righting the action of the colon or large intestine. It excites the circulation of the blood in the organs of the pelvis, and is invaluable in promoting the menstrual flow—in this case it is generally combined with iron and myrrh. It is used for chronic costiveness, but those that suffer from piles should not take it. By reason of its tendency to increase the menstrual flow it ought not to be used during menstruation, especially by those having naturally an abundant flow. It should be avoided during the period of pregnancy. The dose is from five to fifteen grains, generally in pills, combined with other drugs.

MARSHMALLOW (Althea).

Definition.—Marshmallow represents a root. It contains a substance called asparagin, upon which its virtues depend.

Use.—Asparagin renders the drug useful as a means of increasing the flow of the urine. Combined with medicinal lard althea makes an effective dressing in skin diseases. It has been employed also in cough mixtures.

Manner of Using.—The syrup is taken internally. For making a poultice the powdered root may be used.

ALMOND (Amygdala).

Definition.—There are two varieties of almond—the bitter almond and the sweet almond.

Use.—There are two oils of almond: one, the oil of bitter almond, is used in minute doses; the other, known as the expressed oil of almond, may be used in large doses, *i. e.*, as high as a tablespoonful. It is quite important that these two oils should not be confused. Expressed oil of almond and mixture of almond are bland and soothing for local application.

Manner of Using.—Locally or internally, as already indicated.

STARCH (Amylum).

Definition.—Starch is a fine white powder, and is obtained from the seed of the zea mays. It forms a large part of rice, wheat and barley.

Use.—When boiling water is added to starch a very convenient poultice is furnished for local inflammations. Starch, when mixed with water, is a convenient antidote to most corrosive poisons, as it is usually close at hand or can be readily obtained.

Manner of Using.—Starch may be used locally or internally. It may also be used as the basis for an enema to be injected in the bowels.

ANISE (Anisum).

The virtues of this drug depend upon the warming effect when taken into the stomach. As it has a pleasant odor and taste, it is much used in cases of colic in young children.

CHAMOMILE (Anthemis).

Definition.—The flower heads of anthemis nobilis are collected from the cultivated plant. The oil is the active principle.

Use.—The activity of the plant depends upon the presence of the oil. The action of the oil is to act as a sedative to the nervous system; hence its use in checking reflex cough. It also favors free perspiration and free kidney action.

Manner of Using.—Make a drink as follows: Pour a pint of boiling water over an ounce each of chamomile flowers and the leaves and flowering tops of boneset; one-half of this amount is a dose. If the whole amount be taken, emesis or vomiting will be produced, and this will at times be the action desired.

ARNICA, LEOPARD'S BANE (Arnica).

Definition.—The preparations of arnica are obtained from the arnica flowers and arnica root. The flowers are orange-yellow, dish-shaped, with rays.

Use.—Arnica is used in domestic practice, but very little by physicians. The tincture is usually employed in cases of sprains, bruises and for rheumatic pains. Taken internally, in small doses, it produces a sensation of warmth over the body and increases the secretions.

ASAFETIDA (Asafœtida).

Use.—The dry juice of this plant is a powerful stimulant in many nervous affections, particularly in women. Its most frequent use is in the treatment of hysteria. The ordinary dose is from five to ten grains. From fifteen to twenty drops of the tincture may be given as a dose.

MALE FERN (Aspidium).

Definition.—Aspidium is the rhizome of plants found in almost every part of the world. The rhizome has a slight odor and a bitter taste.

Use.—Male fern is used in the expulsion of tape worm. It probably kills the worms in addition to expelling them.

Manner of Using.—When it is suspected or known that a person has a tape worm the following treatment should be carried out. The person should either take no food at all for a day or two or the diet should consist of milk only. The drug should then be given in some agreeable form. It may be given in milk or mucilage. A purgative should follow the use of male fern.

ORANGE (Orantium).

Definition.—The orange represents the fruit of small trees which grow in warm regions of the Eastern and Western Hemispheres. There are two forms, the sweet orange and the bitter orange.

Use.—Like the juice of the lemon, orange juice may be taken in water as a cool drink, and is grateful particularly during the course of fevers. The different preparations of orange are pleasant as flavors. The preparation known as the elixir of orange is an agreeable vehicle for other remedies.

OATS (Avena).

Avena is the fruit of the avena sativa and is used as food in the form of oatmeal, gruel or porridge. It is a highly nutritious food and should be eaten with butter or cream. Skin eruptions, such as eczema, have been attributed to the use of oatmeal. Change of diet in these cases produces a cure for the eczema.

DEADLY NIGHTSHADE (Belladonna).

(See Plate XII.)

BENZINE (Benzinum).

Definition.—Benzine represents a purified distillate from American petroleum. It is a clear, colorless, diffusible liquid. Its vapors, when mixed with the air, are explosive; hence it should be kept in a cool place remote from light or flame.

Use.—Benzine is not used internally in medicine. Externally benzine is used as a counter-irritant. It may be applied by rubbing, or upon a flannel cloth.

BENZOIN (Benzoinum).

Definition.—Benzoin is a gum resin obtained by incisions made into the bark of a tree growing in the East Indies. It occurs in large masses.

Use.—The medicinal preparation of opium known as paregoric contains some benzoin. The tincture of benzoin is useful as an expectorant. The compound tincture is useful for local application as a protectant to excoriated surfaces. Benzoin prevents fat from becoming rancid.

BERGAMOT (Bergamia).

Bergamot is a volatile from the citrus bergamia. On account of its odor, bergamot is valuable in perfumery. It is not used in medicine.

BUCHU (Buchu).

Use.—This is one of the best known remedies to soothe the irritation of the urinary organs. It has been used for catarrh of the bladder and in cases of pain in urinating. Best results are obtained from the infusion made from one ounce of the leaves in two pints of boiling water. Two or three soup-spoonfuls four or five times a day. There is also an extract, which dose is from a half to one teaspoonful.

CAFFEINE (Caffeina).

Definition.—Caffeine is prepared from the dried leaves of the thea sineusis or from the dried seeds of coffea arabica. It occurs also in other plants. It exists in the kola nut of Africa. Caffeine is in the form of colorless silky crystals.

Use.—Caffeine stimulates the nervous system. It quickens the intellect and causes sleeplessness. It causes an increase in the flow of the urine. It is used to stimulate the heart, to increase the flow of urine, and combined with other remedies it is of value in relieving headache of nervous origin.

Manner of Using.—The preparation used is known as citrated caffeine. It is given in powder form.

CALAMUS, SWEET FLAG (Calamus).

Calamus is used as a substitute for tobacco by those habitual to the weed. It is a constituent of various bitters used to stimulate and promote the appetite.

TEA (Camellia).

Definition.—This represents an infusion made from the dried leaves of the Chinese tea plant or Camellia Thea. It contains a substance known as theine.

Use.—Tea is a stimulant removing a sense of fatigue. While this is the ordinary effect of the use of tea there are some, particularly those of a nervous temperament, who cannot partake of it without ill effects.

CAMPHOR (Camphora).

Use.—It is extracted from a tree in India, and is a sedative for many disturbances of the nervous system, especially in hysterical affections of women. Often used to diminish the excitement in fevers. The doses of the tincture vary between ten and thirty drops.

INDIAN HEMP (Cannabis Indica).

Definition.—Indian hemp is obtained from the flowering tops of the female plant of the cannabis sativa grown in the East Indies. There is a confection known as haschish or gunjah.

Use.—This drug is much used in Eastern countries and is a frequent cause of insanity in these countries. It is taken for the pleasant mental effect produced, though this is but temporary. The first stage is accompanied by exhilaration during which the imagination is actively engaged. The imagination brings up images of its own creation. After a time the pleasant effects are followed by unpleasant and disagreeable effects. Ideas of time and space are perverted. Frequent indulgence in the drug brings about permanent mental change. An impulse to kill has been known to follow the abuse of the drug. For medicinal purposes cannabis is used to quiet spasms and produce mental quietude. In accordance with this use it is employed in treating coughs and the restlessness and delirium of certain diseases. It has been used with benefit in neuralgia.

Manner of Using.—The tincture is the preparation usually employed, though it should never be taken without a physician.

SPANISH FLIES (Cantharis Cantharides).

Definition.—Spanish flies represent the dried body of a beetle found in the South of Europe, especially in Spain.

Use.—Internally cantharides is a stimulant to the genito-urinary tract and externally it is employed as a counter-irritant. The tincture of cantharides combined with other remedies is often used in the treatment of alopecia or baldness.

Manner of Using.—When a blister is employed the part may be painted with cantharidal collodion or it may be covered with a rag spread with the cerate. Cantharides requires from six to ten hours to draw a blister, but it is better to remove the drug at the end of four or five hours.

CAYENNE PEPPER—AFRICAN PEPPER (Capsicum).

Definition.—Capsicum represents the dried fruit of a plant which grows in the East Indies.

Use.—Taken internally in moderate amount pepper stimulates the secretions and promotes the appetite and digestion. It also assists in the expulsion of flatus. In large amounts it would cause pains in the abdomen and vomiting. After a drinking debauch a few drops with milk or other light food brings back the appetite. It is useful in constipation.

Manner of Using.—The tincture is used in five- to ten-drop doses.

CARDAMON (Cardamon).

This drug represents a fruit. It is an agreeable vehicle for disguising the taste of other drugs and it also produces a sensation of warmth in the stomach.

CASCARA SAGRADA.

Definition.—Cascara is the dried bark of the rhamnus purshiana, growing on the Pacific coast.

Use.—Its exclusive use is that of a laxative. In chronic constipation it is an excellent remedy.

Manner of Using.—Twenty drops of the fluid extract may be taken after each meal, or half a drachm; that is, half a teaspoonful may be taken at bedtime.

WAX (Cera).

Wax is a concrete substance prepared by the apis mellifica. It forms the honeycomb. It is used to give consistency to ointments and suppositories.

AMERICAN WORMSEED (Chenopodium).

Definition.—Chenopodium is the fruit of a plant growing in North America and Europe. Its properties are due to the presence of a peculiar volatile oil.

Use.—The principal use of the drug is as a vermifuge against the round worms. In Chili it is valued as an aid to digestion.

Manner of Using.—The dose is ten drops in capsule or emulsion three times a day. On the following day castor oil should be given.

CHLORAL (Chloral).

Definition.—Chloral is a colorless liquid formed by the action of chlorine on alcohol. With water chloral forms a crystallizable compound. Chloral should be kept in well-stoppered bottles as the crystals volatilize slowly.

Use.—Taken internally chloral has a sedative influence on the brain and spinal cord. In cases of restlessness and delirium it produces a quieting influence on the brain and induces sleep. In spasm and convulsion it alleviates this condition. It influences the heart adversely, and in cases of weak or diseased heart its use is attended with danger.

Manner of Using.—It is best given well diluted in some agreeable syrup. It should not be taken without the advice of a physician.

CHLOROFORM (Chloroformum).

Chloroform is a heavy liquid made by the action of chlorine on alcohol. It is used in the same class of cases as ether but is preferred to ether in children and old persons on account of the irritation of the bronchial tubes produced by either in the very young or very old.

BLACK SNAKEROOT (Cimicifuga).

Definition.—Cimicifuga represents the rootlets of the plant.

Use.—Upon the nervous system it acts as a sedative. It is claimed that it is of value in rheumatic affections of the muscles.

Manner of Using.—A preparation known as the fluid extract is usually employed and taken in small and repeated doses. A tea of the root, drunk freely, is used in rheumatic affections.

PERUVIAN BARK (Cinchona).

Uses.—This drug has somewhat lost its former popularity, being replaced by quinine and other alcaloids obtained from the same bark. These alcaloids are the best vegetable tonic, as also the surest remedies in malaria. Quinine is also much used in fevers and inflammations. Many have a certain objection to this drug because an excess causes headache, noise in the ears and other disagreeable symptoms. These are, however, temporary, and should not stand in the way of a careful use of the remedy.

COCA (Erythroxylon).

Definition.—Coca leaves are taken from a small tree in Peru and Bolivia. The principal constituent of the leaves is cocaine.

Use.—The value of coca lies in cocaine. Cocaine is widely used locally for the relief of pain. It may be applied for the performance of an operation when for any reason it is not desirable to give a general anesthetic like ether or chloroform.

COCHINEAL (Coccus).

Cochineal is derived from the crushed and dried bodies of the females of coccus cacti. It yields a very brilliant red coloring matter from which carmine is obtained. Cochineal has but little value in medicine in comparison with its use in the arts as a coloring agent.

COFFEE (Coffea).

Definition.—Coffee is the seed or berry of the coffee Arabica. It is one of the sources of caffeine.

Use.—Coffee is a stimulant to the nervous system. It increases the capacity for intellectual effort. When taken to excess it is frequently the cause of headaches.

MEADOW SAFFRON (Colchicum).

Definition.—Colchicum represents the corm and seed of a plant.

Use.—The chief use of colchicum is internally in the treatment of rheumatism.

HEMLOCK (Conium).

(See Plate XIV.)

LILY OF THE VALLEY (Convallaria).

(See Plate IX.)

COPAIBA (Copaiba).

Use.—This balsam comes from a tree in South America. Its principal use is relieving the irritation in inflammations of the urinary channels, especially in gonorrhea.

CREOSOTE (Creosotum).

Definition.—Creosote is obtained from the distillation of wood tar. The best preparation is made from beechwood and is known as beechwood creosote. Creosote is a yellow, oily liquid having a smoky odor.

Use.—Creosote is an antiseptic and local anesthetic. Internally also it is an antiseptic and is used in diarrhœa and dysentery. In consumption its use is often followed by a diminution of all the symptoms and general improvement.

Manner of Using.—It may be given internally in milk, cod-liver oil or wine. It may also be given in capsules.

FOXGLOVE (Digitalis).

(See Plate XIII.)

ERGOT OF RYE (Ergota).

Definition.—Ergot is the compact spawn of a parasitic fungus investing the rye.

Use.—The chief action of ergot is upon the parturient uterus, which it contracts. It assists nature.

Manner of Using.—The fluid extract is the preparation most often employed.

BLUE-GUM TREE (Eucalyptus—Australian).

Definition.—The drug eucalyptus is derived from the leaves of a tree native to Australia, but now cultivated in many countries. It has the property of absorbing and evaporating large quantities. It is readily cultivated in marshy ground, and when so cultivated it absorbs the moisture and renders malarious districts healthy.

Use.—Its place in malaria is inferior to that of quinine.

Manner of Using.—It is used in the form of the oil and the fluid extract.

NUTGALL (Galla).

(See Gallic Acid.)

WINTERGREEN, TEA BERRY (Gaultheria).

Definition.—Wintergreen represents the leaves of a small plant growing in North America.

Use.—Taken internally the oil is antiseptic and antipyretic. This latter refers to its property of reducing the temperature. It is used in the treatment of articular or inflammatory rheumatism. Locally the oil combined with olive oil makes a good application for rheumatic pains.

Manner of Using.—The oil is used internally and locally.

CRANESBILL (Geranium).

(*See Plate XV.*)

GLYCERINE (Glycerinum).

Definition.—Glycerine is a transparent substance obtained by the decomposition of fats or fixed oils. It is a constituent of the waste in the process of the making of soap. It is now prepared in large quantities for commercial purposes.

Use.—Taken internally glycerine is in part absorbed or oxidized and so acts partly as a food. If a large amount, as a tablespoonful or two be taken, it acts as a laxative. Externally applied it acts as an emollient. In the care and treatment of bed sores it is highly useful. The parts should be bathed twice daily with warm water and gently rubbed with glycerine.

LICORICE (Glycyrrhiza).

(*See Plate XI.*)

PENNYROYAL (Hedeoma-Hedeoma).

(*See Plate VIII.*)

HOPS (Humulus).

(*See Plate V.*)

IPECAC (Ipecacuanha).

Definition.—Ipecac is the dried root of a plant which is native in Brazil.

Use.—Ipecac is used as an emetic and expectorant. It enters as an ingredient in cough preparations to soften the expectoration of phlegm. It has been used in heavy doses for dysentery.

FLAXSEED (Linum-Linseed).

(See Plate X.)

MALT (Maltum).

Definition.—Malt is the seed of hordeum distichum, caused to enter the first stage of germination by artificial means and dried. Extract of malt is made with water at a moderate heat and evaporated to the consistency of thick honey.

Use.—Extract of malt is valuable as a food. It is easily assimilated.

Manner of Using.—Extract of malt may be taken alone or it may be taken in conjunction with cod-liver oil, mixing it with an equal quantity of cod-liver oil.

HONEY (Mel).

Definition.—Honey is a saccharine secretion deposited in the honeycomb by the honey-bee, the apis mellifica. The best honey is known as virgin honey. It is obtained by incising recent combs and straining. Clarified honey is made by heating honey, removing the frothy scum and straining. Other products made by the aid of heat are of a darker color and are less pure.

Use.—Honey is to some slight extent a laxative. It is a pleasant, sweet article of food.

COD-LIVER OIL (Morrhuæ Oleum).

Definition.—Cod-liver oil is a thin, yellow, oily liquid, having a fishy odor and taste. It is obtained from the fresh livers of the cod.

Use.—Cod-liver oil is an easily digestible food. In most cases of poor nutrition it is of value.

Manner of Using.—Cod-liver oil should not be taken directly after a meal. It should be taken about three hours after a meal, when gastric digestion is about complete, from the fact that oil is digested not in the stomach but in the intestine.

NUTMEG (Myristica).

Definition.—Nutmeg is the seed of a tree growing in the East Indies, but cultivated also in the West Indies and in South America.

Use.—Internally small doses favor digestion by stimulating the secretion of the gastric juice. It is used to disguise the taste of unpleasant mixtures and as a flavor.

Manner of Using.—The oil or the spirits may be used.

MYRRH (Myrrha).

Definition.—Myrrh is a resinous exudation obtained from a tree. It appears as brownish-red masses.

Use.—Myrrh is slightly astringent and stimulant locally, hence its use as a mouth wash. Combined with other remedies it is sometimes employed as a cough medicine.

POISON NUT (Nux Vomica).

Definition.—Nux vomica is the seed of the strychnos nux vomica of East Indies. The seeds are disk-shaped, about an inch in diameter, and covered with silky hairs.

Use.—Nux vomica is one of our best tonics, as also one of the most dangerous poisons. These properties principally belong to strychnine, an alkaloid. It is also a good bitter tonic, which property is especially efficacious in the nervous system. It is often used in the treatment of dyspepsia.

Manner of Using.—The tincture of nux vomica is the preparation usually employed. Strychnine is used advisedly.

OLIVE OIL (Oleum Oliva) SWEET OIL.

Definition.—Olive oil is a yellowish oily liquid, having a slight odor and a bland, oleaginous taste.

Use.—Taken internally olive oil is used in the treatment of biliary colic, five or six ounces being the dose. It acts by promoting the flow of bile. Externally the oil is used as an emollient. It is employed in the treatment of burns and in eruptive diseases inunctions of the oil are useful in allaying irritation and preventing the spread of the disease through or by means of the cast-off epidermis. Olive oil is extremely useful as an enema, the oil being used warm for the injection.

OPIUM (Opium).

(*See Plate VIII.*)

PUMPKIN SEED (Pepo).

Use.—Extensively used in expelling the tapeworm from the intestines. In order to obtain this object the patient, during the twenty-four hours, should take no other food but the seeds and milk, partaking abundantly of both whenever hungry. After the twenty-four hours a dose of castor oil should be taken.

PEPSIN (Pepsinum).

Definition.—Pepsin is one of the elements of the gastric juice. In cases of deficiency of this element there is presented one form of dyspepsia. The object, then, is to assist nature by replacing the pepsin. We therefore look to the lower animals for assistance and select the hog, calf or the sheep. The acid mucous secretion is scraped from the surface of the stomach, spread on a glass and dried in scales. Saccharated pepsin is pepsin obtained from the gastric mucous membrane of the hog mixed with sugar of milk. It is a white powder of a disagreeable odor and taste. A solution of this is made and forms liquor pepsin.

Manner of Using.—The powder may be used, or a rather pleasant liquid preparation called the wine of pepsin may be used.

CALABAR BEAN (Physostigma).

Definition.—Physostigma is the seed of the physostigma venanosum, growing in Western Africa, along the River Niger.

Use.—The chief action of the drug is to depress the spinal cord, and in accordance with this action it is used to produce quietude in cases of convulsion, as from strychnine poison, from tetanus, and so forth.

ALLSPICE (Pimenta).

Definition.—Allspice represents a fruit.

Use.—It is employed chiefly to promote appetite and digestion. It may be used to disguise the taste of unpalatable drugs and is one of the ingredients of spice plasters.

Manner of Using.—Internally, the oil is the preparation used in drop doses.

PEPPER, BLACK PEPPER (Piper).

Definition.—Pepper is the unripe fruit of the piper nigra of India.

Use.—Pepper is a condiment. It is stimulating to the digestive system and to the circulation. Pepper externally is an irritant.

MAY APPLE (Podophyllum).

Podophyllum is a slow cathartic acting upon the liver and the intestinal glands. On account of the smallness of the dose and the slight taste podophyllum is much used in the treatment of constipation of children. A grain may be dissolved in the spirit of ginger and a drop or two given on sugar.

RHUBARB (Rheum).

Definition.—Rhubarb represents the root of a plant native in Asia.

Use.—In moderate doses rhubarb acts as a purgative and stomachic. In chronic constipation it is an excellent remedy. It is useful in the summer diarrhœa of children.

Manner of Using.—The aromatic syrup is a favorite method of administration. It may be given also in the form of pills.

CASTOR OIL (Ricini Oleum).

Definition.—Castor oil is a fixed oil expressed from a seed. It is a pale-yellow liquid, having a faint odor.

Use.—Castor oil is a slow purgative, producing copious liquid stools. It stimulates the bowels.

Manner of Using.—The dose for an adult is half to one ounce; for a child, one to two drachms.

SUGAR (Saccharum).

Definition.—Sugar is a product of the sugar-cane of sub-tropical countries.

Use.—Syrup which is used as a vehicle for the administration of drugs consists of 85 per cent. of sugar. Sugar of milk is a peculiar crystalline sugar obtained from the whey of cow's milk by evaporation and purified by recrystallization. It is used in pharmacy.

SARSAPARILLA (Sarsaparilla).

Definition.—Sarsaparilla represents a root from Mexico, Central America and Brazil.

Use.—Sarsaparilla is an alterative. It is also a vehicle to disguise the taste of unpleasant drugs.

SENNA OR SENA (Sena).

Use.—A violent cathartic, with watery stools, having the disadvantage that it is apt to produce strong colic. Generally given with some aromatic. The most pleasant form is the preparation known under the name of prepared licorice powder.

WHITE MUSTARD (Sinapis Alba).

BLACK MUSTARD (Sinapis Nigra).

(*See Plate IV.*)

TOBACCO (Tabacum).

Definition.—The leaves of the tobacco plant represent the part used. The tobacco plant is indigenous to the Southern portions of this country. It was carried to Lisbon by the Spaniards and from there to France by Nicot in 1560.

Use.—When persons not accustomed to tobacco indulge in it emesis or vomiting, with great muscular relaxation, results. It is a stimulant to the salivary and intestinal secretions. Nicotine is a rapidly acting poison resembling hydrocyanic acid in its fatal effects. The power of increasing secretions along the alimentary canal, the stimulation of peristalsis and the function of the kidney are proper arguments in favor of moderate use of tobacco.

TURPENTINE (Terebinthina).

Definition.—Turpentine is a concrete oleoresin obtained from the pine tree.

Use.—Generally used to stop bleeding at the nose, the stomach, the intestines and the bladder. It is sometimes used in combination with other remedies for various intestinal troubles. Partially, turpentine is used with the same objects as mustard, that is to say, to produce irritation of the skin. A piece of flannel, after being folded and saturated in hot water and wrung, is sprinkled with the spirits of turpentine.

VALERIAN (Valeriana).

(See Plate XIII.)

GINGER (Zingiber).

Ginger comes from various sources, but Jamaica ginger is preferred for culinary purposes, as it has the best flavor. Ginger increases the secretions of the intestinal tract and acts as a carminative. It is used in various preparations to disguise the unpleasant taste.

PART III.

ANIMAL JUICES AND EXTRACTS.

Among the many marvelous advances of modern medicine is the interesting one which treats disease by the use of organs or glands taken from the animal economy. This applies to a restricted class of diseases, but we find that with the increase of our knowledge of disease the class amenable to treatment with animal extracts also increases.

Origin of the Subject.—The subject is yet in an unsettled and undeveloped condition, yet in some instances the results have been most certain and positive. Much as is known upon the subject of the anatomy and physiology of our bodies, there are certain organs, such as the spleen, the functions or uses of which were long a matter of controversy.

Illustration.—An illustration will make the matter clearer. Situated at the upper part of the trachea or windpipe is a gland weighing about two ounces. It will be more readily comprehended when it is mentioned that it is a disease of this gland that constitutes a goitre. The purpose and use of this gland (called the thyroid gland) was for a long time not understood.

History.—King, of London, at the close of last century, held some advanced ideas on the thyroid gland, but it was not until well on to our own day that much was definitely known. Experiments were first made upon animals, dogs being selected. It was found that when the gland was removed from the animal certain definite symptoms developed. As these did not exist before it was fair to suppose that their presence was a result of the loss of the gland. Schiff, in 1859, found that if in a dog from which the gland had been removed a healthy gland from another dog was transplanted in the abdominal cavity, the usual symptoms failed to appear.

Gland Treatment.—It was not until 1883 that Kocher and Reverdin showed that the same phenomena occurred in man under like conditions. Investigations had in the meantime shown that disease of the gland produced symptoms similar to those appearing on its removal. It therefore followed that we had a means of treating a large number of obscure diseases depending more or less upon disease of the thyroid gland. This method of treatment is to administer to a patient the thyroid gland of an animal, the sheep usually being selected.

We shall now take up the more important animal extracts.

Bone-Marrow.—The use of bone marrow is based on the supposition that the red blood corpuscles are produced mainly in the red bone-marrow. In cases where the blood or its corpuscular elements have been deficient great benefit has followed the use of red bone-marrow. All forms of anemia are thus benefited. The method of preparing the bone-marrow is to comminute the anterior extremities of calves' ribs and expose the cancellous tissue. The fragments are then placed in a jar and covered with glycerine. It is so kept for three or four days. The liquid is then strained. A teaspoonful three times a day is the usual dose.

Brain and Nerve Extract.—A number of investigators have treated various nervous diseases with extracts made from the brain cortex. A glycerine extract made from the brain and spinal cord of the sheep is usually employed.

Ovarian Extract.—In disturbances following removal of the ovaries or uterus, or in the nervous states following or attending the menopause, ovarian tissue administered has given great relief. The ovarian tissue may be administered in two forms. Heifer's ovaries are reduced to powder by a process of drying. The powder is then made up into pills. Another method of administration is in the form of the glycerine extract.

Pituitary Extract.—There is a small body in the brain known as the pituitary body. A disease accordingly shows after death abnormal conditions of this gland. Exhibition of some form of pituitary body during the course of the disease is followed by happy results.

Splenic Extract.—Preparations from the spleen have been used with advantage in certain blood disorders notably in that form where the white corpuscles are increased. After removal of the thyroid gland symptoms develop which may be checked by the use of splenic extract.

Suprarenal Extract.—Placed on the top of each kidney is a small body known as the suprarenal capsule. Experience has abundantly proven that the disease known as Addison's disease can be checked by the use of a preparation made from these small bodies. Just what their exact function is cannot at present be stated.

Testicular Extract.—It is a well-known fact that after removal of the testicles, the manly characteristics, if it be done quite early, fail to properly develop. In these cases, and as well in those cases where the operation is done later, it is found that the use of testicular extract increases the mental and physical vigor.

Thyroid Extract.—In an article of this kind it would not be proper to more than mention the list of maladies that have been benefited by the use of preparations of the thyroid gland. Among these may be mentioned arrested mental development, goitre, cretanism, obesity, lupus, psoriasis and disorders of lactation. Many forms of insanity improve with its use. Syphilis is sometimes benefited to a slight degree. While in many cases there are unfavorable circumstances and symptoms which prevent the best results, the fact that so many cases are benefited warrants their further investigation and trial.

Book VI.

HEALTHY DWELLING HOUSES.

HOW TO BUILD, VENTILATE, ORNAMENT, DRAIN AND CLEANSE THEM.

BY

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PART I.

SITE, CONSTRUCTION, AND INTERNAL DECORATION OF HOUSES.

Conditions of a Healthy Home.—The conditions necessary to insure a healthy habitation have been summarized by Dr. Parkes as follows:

1. A site dry and not malarious, and an aspect which gives light and cheerfulness.
2. A ventilation which carries off all respiratory impurities.
3. A system of immediate and perfect sewage removal which shall render it impossible that the air shall be contaminated from excreta.
4. A pure supply and proper removal of water, by means of which perfect cleanliness of all parts of the house can be insured.
5. A construction of the house which shall insure perfect dryness of the foundations, walls and roof.

Choosing a Site.—The site for a dwelling is rarely selected from a consideration of the healthiness of the location, particularly in its relation to the conditions of the soil. Other considerations, often of an accidental character, more frequently determine the choice. And yet there is no more important subject to be taken into account in planning a house, none which demands a closer scrutiny, in view of its influence upon the health of the occupants, than the character of the soil in which its foundations are laid.

Effect of Soil on Health.—It is only within recent years that public attention has been generally directed to the important relationship existing between certain physical characteristics of the soil and health. The ground-air, ground-water and dampness have all been studied in connection with their agency in the production of certain diseases of common occurrence, and important facts have been arrived at, which are of great advantage in instituting measures for the preservation of health.

Diseases Due to Damp Soils.—Paroxysmal fevers, typhoid fever, bilious remittent fever, dysentery, diphtheria and cholera (during epidemics of that disease), have all been attributed to earth effluvia. It is a well-known fact that dampness of the soil will cause catarrhal affections, rheumatism and neuralgia.

Consumption and Damp Soils.—It has been clearly shown that dampness of the soil under houses is one of the chief factors in the production of consumption—that plague of our climate which destroys more lives than any other disease. Typhoid fever has also been supposed to be connected with changes in the water in the soil. A similar view is held with regard to dysentery, bilious remittent fevers and cholera. It is thus seen how potent are the influences of certain conditions of the soil in undermining health, and in causing disease, and therefore how important it is to use every means for protecting ourselves against these enemies of health.

The Air in the Soil.—All soils and most rock formations are more or less porous, and are capable of holding in their pores and spaces air or water, or both. When air as well as water is present, the soil is said to be moist. Only the hardest rocks are free from air. Gravel and loose sands are well known to be very porous, the latter containing often as much as half their bulk of air. The amount of air in some varieties of soft sandstones sometimes reaches 40 per cent.

Composition of Soil Air.—The composition of the air in the soil is variable, and differs widely from that of the free atmosphere. Carbonic acid in variable quantity is usually one of its constituents. The origin of this gas is supposed to be due to organic changes taking place in the soil itself. It cannot be derived from water precipitated from the atmosphere, as the amount of this gas in meteoric water is exceedingly small. Nor is it to be sought for in the ground-water as a source; but it most likely derived from the soil, and is imparted to the ground-water and ground-air simultaneously, but more freely to the latter on account of its greater absorbent capacity.

Sources of Polluted Ground-Air.—The ground-air contains more or less moisture, and is liable to be contaminated by effluvia and organic matter arising from the constituents of the soil. A frequent source of ground-air pollution in inhabited places is the impurities which soak into the soil from leaking cesspools and drains, from badly-constructed sewers, from leaky gas-mains, and from deposits of filth upon the surface of the ground.

Motion of Soil Air.—It is important to observe that the air in the soil is in continual movement. This movement is especially active in dry, porous soils. The motion of the air in the ground is caused by pressure of the atmosphere and wind against its surface; by changes in the temperature of the lower strata of the atmosphere and of the upper surface of the soil, by the rainfall, and by changes in the level of the ground-water; and to some extent by the operation of the law of diffusion of gases.

Closing of Ground-Pores.—At every rainfall, the pores of the superficial layers of the ground are closed by the inflowing water, so that the upward escape of the imprisoned air is hindered, while the rise in the ground-water exerts a pressure from the opposite direction; under the circumstances the ground-air seeks an outlet at the point of least resistance, and in many cases escapes into dwellings—the more freely, the more extended and copious the rainfall.

Currents in Ground-Air.—A current in the ground-air may be caused by local conditions; thus, a house artificially heated, being warmer inside than the external air, will cause a current of air to enter it from the ground on which it stands. Any impurities in the surrounding soil may find access to the house through this channel.

Coal-Gas in Dwellings.—Numerous instances have been recorded of the penetration of coal-gas into dwellings through the pores of the soil under the basement floors, the entrance of the gas being facilitated by the activity in the current of ground-air caused by the heated house. Ill-health, and even death, has been caused by gas escaping into houses in this manner. In the same way the air made noxious by the oozings from cesspools and broken drains, and by foul matters contained in the soil, may gain entrance through the foundation floors.

FEATURES OF A HEALTHY SITE.

A Clean, Natural Soil.—A clean, natural soil, such as is free as possible from those organic changes or processes which cause unhealthy emanations, should be the prime object in changing the location of a dwelling. No effort should be spared in improving the healthiness of a site. This may be accomplished by keeping the soil clean through efficient drainage, abolition of cesspools and other sources of filth-impregnation, and an abundant source of water for maintaining cleanliness in all parts of the house. And further, by making the ground floors and walls, as far as possible, impermeable to air.

Dangers of Made-Ground.—"Made-ground" is to be looked upon with the greatest suspicion. Such a soil, generally composed of the refuse of a town, is necessarily very impure, and a house built upon it is liable to be unhealthy. A process of purification by oxidation and the influence of rain naturally takes place in the course of time, but the uncertainty of the result should always be determined by an examination of the ground. It is, however, best to avoid such a location altogether.

Of Porous Soils.—Porous soils, such as those composed of gravel or rubble, are generally supposed to be healthy, but the assumption is not to be taken without qualification. The great facility which they afford for the circulation of air, and, through this medium, of conducting impurities for a long distance, aided by the suction power of the house, makes it essential that such soils, in order to be healthy, should be free from noxious effluvia and deposits of animal or vegetable matter.

Danger of Porous Soils.—Dry, porous soils, otherwise unobjectionable, may be the source of malarial exhalations. The ground in inhabited places, and even about isolated dwellings, often becomes impregnated with filth from sewers, broken drains, cesspools, and refuse heaps, which undergoes decomposition and gives rise to noxious gases which are dangerous to health in proportion to the degree of concentration.

Ferments in Soil.—Such a filth-sodden soil is, moreover, a convenient *nidus* for the production of those morbific ferments which seem to be connected with certain palpable organisms, which are looked upon as very important agents in the production of some of the common diseases that afflict humanity.

Diseases from Soil Emanations.—Among the diseases which have been attributed to emanations from the soil may be mentioned typhoid fever—that scourge of the country as well as the city—cholera, malarial fevers, dysentery and diphtheria.

To Prevent Soil Emanations.—As it is impossible to prevent the circulation of the air in the ground, structural devices must be employed to keep the soil-exhalations from rising up into the house. This is best accomplished by covering the entire site of the house with a layer of cement, concrete, asphalt or some other impervious material. A layer of concrete at least six inches deep, well rammed and well grouted with liquid cement, and made smooth upon the surface, makes a most satisfactory barrier to the ground-air and dampness.

PREVENTION OF SOIL EXHALATIONS.

Ground Air.—Every house should be protected from access of ground air. The selection of a proper site has much to do with this, but not all, for since it is impossible to prevent the circulation of ground air, certain devices must be employed to keep soil exhalations from rising into the house.

The Best Device.—The best device for this is to cover the entire site with a layer of cement, concrete, asphalt or some impervious material. A layer of concrete six inches deep, well rammed and grouted with liquid cement, is a most satisfactory barrier to ground air and dampness. Asphalt over concrete also affords an excellent barrier. Such a floor has the advantage of being free from cracks and holes which harbor vermin.

Dampness of Soil Injurious.—Dampness of soil is dangerous to health. A dry, porous soil with possibilities of natural drainage will be found to be salubrious. Elevation of site is an indication of the presence of this condition. A damp condition of soil may be kept up by injudicious planting of trees and shrubs too near the house or by neglect in diverting drainage to some distant outlet and thereby preventing its absorption by the soil.

House Aspect.—In choosing a house site preference should always be given to the aspect or exposure which gives most light and cheerfulness, insures free circulation of air without being subjected to violent gusts of weather and is defended as far as possible from North and East winds; a location free from mists and fogs, sudden shiftings of temperature and malarial and other injurious influences.

Removing Soil Dampness.—For a building to be healthy the subsoil water should never be allowed to rise to the level of the foundations. To prevent this ordinary land drainage pipes should be so laid as to carry off the subsoil waters into some sewer or other outlet.

Foundations.—Foundation walls should be composed of the best materials and to prevent moisture being absorbed by the materials, thereby injuring the walls and timbers and rendering the atmosphere within unhealthy, a damp-proof course of some impervious substance like cement should be built in the wall just above the surface of the ground.

External Walls.—The walls of a house are sometimes rendered damp by exposure to continued wet weather. Various means have been employed for protecting the outside walls in exposed positions. Smooth, hard bricks, glazed bricks, slate, cement, weatherboards and tin have all been satisfactorily used for this purpose and under a variety of circumstances. Some walls are improved by a coating of good paint, but its frequent renewal makes it expensive. Hollow walls are not unfrequently constructed as a protection against dampness. Two parallel walls are constructed with a space between them three or four inches wide and joined together with bonding-ties of iron or stoneware. By this plan not only is dampness excluded but a more equable temperature is maintained in the house.

Construction of External Walls.—Whatever be the material chosen for the external walls it should be of the best quality and well put together. If stone or brick be chosen, and the latter is always preferable as being fire-proof, the laying should be done in well-tempered mortar or cement, and the wall should be of sufficient thickness to insure stability, keep out weather and protect the air of the house from the influence of sudden weather changes.

Chimneys.—To insure safety against fires the brickwork of chimneys and fire-places should be at least nine inches thick, and no wooden plugs or bricks should ever be inserted in it lest they become charred and ignite and set the house on fire. Terra-cotta linings to chimneys are a source of safety and cleanliness. So far as possible chimneys should be straight and have a smooth interior so as to facilitate the draught.

The Roof.—A good roof is an important part of a sanitary house. If not properly constructed it is a constant source of annoyance. Slate, tiles, zinc, copper, lead, tin and shingles all make substantial roofs. Tarred felt and gravel compositions are not to be recommended except for temporary structures. Metal roofs require but little slope, but the slope of slate, shingle or tile roofs should be steep. Great care should be taken in the arrangement and making of gutters, spoutings and pipes.

Floors.—These should be of well-seasoned lumber and laid so as to present a smooth, even surface, free from cracks. The plowed and grooved floor and the doweled floor have great advantages. Fire-proof floors are desirable but not adapted to ordinary dwellings. Basement floors should be of concrete.

Floor Coverings.—The inlaid flooring composed of different woods and known as parquetry is ornamental and very effective when it is intended to dispense with carpets. Carpets were formerly much more used as floor coverings than at present. They are not a sanitary covering on account of their susceptibility to collect dust and dirt and they are difficult to remove and shake. The present fashion of abandoning the closely fitting carpets and substituting parquetry rugs and square carpets on stained or varnished floors is an important step toward effecting improvement in the sanitary condition of dwellings.

Wall Coverings.—For cottages and inexpensive dwellings no wall covering is better or healthier than lime whitewash. It may be rendered artistic by coloring, and can be renewed readily and cheaply. Paint answers as an excellent wall covering. It produces a smooth, hard, non-absorbent surface which can be washed when necessary. Paper is most used at present as a wall covering, but it is doubtful if it is a good sanitary covering, as it is absorbent of moisture and is very apt to become saturated with impurities in the heated air of rooms. Moreover, many wall papers are dangerous from the fact that some of their colors, especially the green, are derived from poisonous substances.

Woodwork.—The woodwork about the house may be stained and varnished, or oiled and polished, or painted. Natural wood, oiled and polished, or varnished, the pores first having been "filled," makes a most desirable finish, and is rapidly coming into general use. Whatever may be the choice in this respect it is important that the materials used shall, as far as possible, be impervious, and so applied as to present a smooth, even surface that will repel dust and dirt and admit of being easily cleaned. This recommendation applies with equal force to all the interior finishing of the house.

Internal Decorations and Furnishings.—The internal decoration and fittings or furnishing of the house may exert no inconsiderable influence on health, and it is therefore important that they conform, as far as possible, to the principles of sanitation, so as to conduce to the health as well as the comfort of the occupants. It is clearly evident that all furniture, which, by its excessive decoration or peculiar construction, collects and conceals dust and dirt that cannot be easily detected and removed; all heavy drapery, so commonly hung in profusion about living and sleeping apartments, which cannot be cleaned with facility and which excludes light and air; all over-ornamentation of ceilings and cornices by elaborate mouldings which defy all attempts at cleansing; the so-called artistic furniture loaded down with ornaments of china and glass, and "what-not," which furnish so many hiding places for the ever-present dust; all these are, to a great extent, objectionable and unhealthy.

PART II.

VENTILATION AND HEATING.

Necessity for Pure Air.—Too frequently the castles of the rich as well as the humble dwellings of the poor are so scantily supplied with air of proper quantity and quality as to become the breeding places of disease. Pure air is essential to our well being. Perfect health is impossible without it.

Indoor Lives.—A large part of our lives are spent indoors, and frequently under conditions which exclude pure air, the consequences of which are seen in impaired health and aggravation of disease. The more nearly the air of our homes comports in purity with that of the external atmosphere the more capable it is of sustaining the vital forces of the body.

Normal Air.—The essential elements of air are oxygen and nitrogen. Minor ingredients are found, as carbonic acid, watery vapor, traces of organic matter, and ozone, the latter a high form of oxygen.

Oxygen.—Oxygen is the active principle of air—the element necessary to the support of life. Nitrogen is a mere diluent, to prevent the oxygen from destroying everything with fire and rust. Carbonic acid is present only in small and variable quantities. It does not help to sustain animal life, but is an essential support of plant life. The presence of watery vapor in air constantly fluctuates according to temperature. When air can take no more water it is said to be saturated, the point of complete saturation being 100. Air best adapted for health contains about 50 to 75 per cent. of saturation.

Per Cent. of Air Constituents.—Pure mountain air analyzes thus, in parts of 100—

Oxygen	20.96
Nitrogen	79
Carbonic acid	.04
Ozone	variable.
Vapor	varies with temperature.
Organic matter Ammonia	minute traces.
Suspended matter	variable.

Uniform Composition of Air.—The composition of air varies but little in different parts of the globe. By the law of diffusion and the effect of winds, nature is ever dispersing the impurities which man, through ignorance, is constantly discharging into the atmosphere.

CAUSES OF IMPURE AIR IN ENCLOSED SPACES.

Enumeration of Causes.—Noxious gases and irritating substances given off by certain trades and manufactures, effluvia from sewage and other refuse matter, uncleanness, respiration, skin exhalations, products of combustion, are all causes of air impurities.

Avoidable Causes.—Most of the above causes are avoidable, and should be attended to promptly by removal of the cause. But ventilation must be depended upon to purify the air of dwellings, which is rendered impure mostly by the products of combustion. These products are chiefly carbonic acid, carbonic oxide, water and smoke. The product of fires may pass into the air through chimneys, but those generated by lights remain in the rooms.

Air Vitiated by Respiration.—The most common causes of deterioration of the air are respiration and cutaneous transpiration of men. We constantly change and pollute the air in our houses by depriving it of a portion of its oxygen in its passage through the lungs, and by adding to it an increased amount of carbonic acid derived both from the lungs and from the skin. Foul organic matter and moisture are also exhaled from the lungs and from the surface of the body. Carbonic acid is injurious when present in excess; but it is the organic matter in inhabited rooms that is most hurtful, and which renders the air close and offensive. These alterations and pollutions are the inevitable results of the constant and unalterable processes of life, and therefore cannot be avoided.

Object of Ventilation.—By shutting out the pure air of heaven and by polluting the limited supply within our dwellings, we attempt to thwart the design of nature and deny ourselves the blessings of health. It is evident the nearer the air in our dwellings approaches in composition the outer air the more it conforms to the natural standard of purity, and, therefore, the better adapted to the needs of the economy. This is the object intended to be accomplished by ventilation. Of course, it is not possible to attain to this standard absolutely, without dangerous exposure to currents of air or draughts. Nevertheless, by the use of well-known devices, the air of our dwellings may be rendered fresh and wholesome and not perceptibly different from the outer air.

Changes in Air Produced by Breathing.—According to Dr. de Chaumont, the changes produced by respiration and transpiration are the following:

1. The oxygen is greatly diminished.
2. The carbonic acid is largely increased.
3. A large amount of watery vapor is produced.
4. There is a considerable evolution of ammonia and organic matter.
5. A notable amount of suspended matter is set free, consisting of epithelium and molecular and cellular matter, in a more or less active condition. At the same time portions of the epithelium are constantly being given off from the skin, and even pus-cells from suppurating surfaces.

Quantity of Air Breathed.—A man breathes about fifteen or sixteen times a minute, discharging at each expiration from twenty to thirty cubic inches of air, so that in the course of a day about 350 cubic feet of air pass through the lungs. This air is warmed and loaded with watery vapor and gains a large amount of carbonic acid (nearly five per cent.), while the quantity of oxygen is greatly diminished (about five per cent.). The oxygen is diminished in direct ratio to the consumption of carbon and hydrogen in the system.

Carbonic Acid and Other Impurities.—The amount of organic matter in the air of a room vitiated by respiration increases in proportion with the carbonic acid. Thus the carbonic acid becomes a measure for the other impurities. If there is a great deal of carbonic acid present it may be inferred that the other impurities of a more injurious character are proportionally increased. It has been ascertained by numerous examinations that the organic matter is generally perceptible to the sense of smell when the carbonic acid reaches six-tenths of one volume in 1,000 volumes of room-air, and this has been taken as the limit of impurity. When it reaches one volume in 1,000 volumes the odor is very strong and the air is said to be "extremely close."

Effects of Breathing Impure Air.—If we inquire into the condition of the atmosphere in public houses, in theatres, churches, concert-halls, court-houses, schools, ball-rooms, drawing-rooms, bed-rooms in the elegant and carefully appointed houses of the rich, the comfortable-looking homes of those in fair circumstances, as well as the humble dwellings of the poor, the evidence is everywhere apparent that the subject of ventilation is too little heeded, in very many cases entirely ignored. It is fortunate for our well-being that only a portion of our lives is spent within doors. Ill ventilation being the general condition, and a very constant one, Dr. de Chaumont has felt justified in connecting it with the prevailing diseases which are the chief sources of mortality. He states, after a very critical inquiry into the subject, that we are entitled to connect the great death-rate from heart-disease, atrophy and debility and convulsions, and particularly that due to consumption and respiratory complaints, with one constant condition affecting the whole community, namely, breathing impure air.

Standard of Impurity.—The amount of carbonic acid in normal air averages four-tenths of a volume in 1,000 volumes of air, or four volumes in 10,000; and it has been determined by the best authorities that this amount ought not to be increased beyond six-tenths of a volume in 1,000. When present in excess of this amount the air of an inhabited room becomes perceptibly impure. The standard of maximum impurity as generally accepted is therefore six-tenths of a volume in 1,000—that is, four-tenths of a volume in the original air and an additional two-tenths derived from respiration. As long as this ratio is not exceeded, the air-space may be said to be properly ventilated.

Amount of Fresh Air Required.—Having arrived at the standard of purity, the next thing to determine is the supply of fresh air required per head in each hour to maintain the air of a room within the limits of this standard. It has already been stated that an adult man gives off from his body six-tenths of a cubic foot of carbonic acid in an hour, and the amount of carbonic acid naturally in the air being four-tenths of a volume in 1,000, it is determined, by calculation, that the amount of fresh air required to be supplied per hour to each individual, in order to preserve the air-space in a state of freshness, should be 3,000 cubic feet. The following useful table is taken from Parkes' Hygiene. The parts of a volume are given in decimals:

TABLE TO SHOW THE DEGREE OF CONTAMINATION OF THE AIR (in Terms of Carbonic Acid) BY RESPIRATION, *and the amount of air necessary to dilute a given standard of .6 per 1,000 volumes of air, of which .4 is carbonic acid naturally existing, and .2 is from respiration. In the table a deduction is made of the initial .4 volumes of carbonic acid per 1,000 for the sake of clearness*

Amount of cubic space (= breathing space) for one man in cubic feet.	Ratio per 1,000 of carbonic acid from respiration at the end of one hour if there has been no change of air.	Amount of air necessary to dilute to standard of .2, or, including the initial carbonic acid, of .6 per 1,000 volumes during the first hour.	Amount necessary to dilute to the given standard every hour after the first.
100	6.00	2900	3000
200	3.00	2800	3000
300	2.00	2700	3000
400	1.50	2600	3000
500	1.20	2500	3000
600	1.00	2400	3000
700	0.85	2300	3000
800	0.75	2200	3000
900	0.66	2100	3000
1000	**0.60**	**2000**	**3000**

Space Necessary for Ventilation.—From the above table it is seen that a healthy adult requires 3,000 cubic feet of air per hour to preserve the air of an inhabited room in a wholesome state of freshness. In order to secure the required change, without running risk of currents and draughts, a certain amount of cubic air space is necessary. If the room be small the air must be changed more frequently than when it is large, and as the rate at which the air passes through the smaller space is more rapid the risk of taking cold from draughts is greater.

Advantage of Large Space.—With a large room, or space, say one of 1,000 cubic feet, the problem of ventilation becomes much easier. The current of fresh air is more easily broken up and mixes more readily with the larger volume of air in the room, and the occupant, being further from the opening, does not perceive the movement of the air. It may be incidentally remarked that a large space offers greater facility for insensible ventilation, since the larger wall-space and more numerous windows permit of a greater change of air, and thus, with equal means for ventilation, a large roo mwill have a less degree of impurity than a small one. To a certain extent provision can be made for the requisite amount of air by the size of the room, from the fact that the air is longer in reaching the limit of admissible impurity in a large space than in a small one, but this can never be possible for any length of time; and it becomes absolutely necessary to renew the air from time to time however large the space may be. Dr. de Chaumont gives the following results of an experiment to determine the length of time it would take to bring the air to the limit of permissible impurity (six -tenths per 1,000 of carbonic acid, initial and respiratory) in unventilated spaces of dfferent sizes:

One man in 10,000 cubic feet	3 hours 20 minutes.
One man in 5,000 cubic feet	1 hour 40 minutes.
One man in 1,000 cubic feet	20 minutes.
One man in 600 cubic feet	12 minutes.
One man in 200 cubic feet	4 minutes.
One man in 50 cubic feet	1 minute.
One man in 30 cubic feet	36 seconds.

Air from Pure Source.—In fixing the amount of air required per head per hour for the purposes of ventilation it is assumed that the supply obtained is of normal quality, that is, air containing on an average four-tenths of a volume of carbonic acid in 1,000 volumes. It is a fortunate circumstance that the external air maintains a remarkable uniformity of composition, the variations even in thickly-populated places not being very great. It is from this homogeneous atmosphere that we are to draw our supply for ventilation. The caution is to be observed to secure this air in its originally pure condition, or as pure as possible under given circumstances, and not after it has become polluted from any one of innumerable sources which so frequently exist in and about the house.

Distribution of Air.—The distribution of the air throughout the rooms is a matter of importance and can be accomplished by proper attention to the arrangement of the openings. As nearly as possible uniform diffusion ought to be secured, for by this means the chance of rebreathing respired air will be greatly diminished. There have been differences of opinion with regard to the relative positions of the inlets and outlets for air. Some have held that the outlets for foul air should be near the floor, so that the air defiled by impurities could be immediately withdrawn and its place supplied by the purer air from above. Under some circumstances this practice may be advised, as, for example, in certain trades and arts in which the impurities, from their weight, gravitate toward the floor, and in cases where mechanical devices are used for withdrawing the air; but in dwellings, where the impurities of respired air are mainly to be contended with, and which tend to ascend on account of the temperature, the proper place for the discharge of foul air is near the ceiling.

Temperature of Dwellings.—The air of our dwellings must be comfortably warmed, for, as Dr. Russell remarks, people will prefer being poisoned comfortably to thriving in cold air. The temperature of comfort has been fixed at various points by different writers. Dr. de Chaumont fixes a standard temperature at from 63 degrees Fahrenheit to 65 degrees Fahrenheit. English writers agree pretty generally upon a temperature of from 60 degrees Fahrenheit to 65 degrees Fahrenheit. This, from an American standpoint, would seem to be too low, and a range of from 65 degrees Fahrenheit to 70 degrees Fahrenheit would, in the main, be more satisfactory to our comfort. However, the question is one which must be determined by the sensations of the majority as to comfort. As a rule, those who are well clothed, well fed, and who are accustomed to plenty of exercise, require less warmth.

Natural Ventilation.—As a ventilating power the force of the wind is of the greatest service. In the country, where the houses are generally surrounded by pure air and are exposed to the free action of the wind, the operation of this force contributes very largely to the factors entering into good ventilation. In the closely built-up city the conditions for utilizing this agency are not so favorable. By opening the windows and doors and allowing the wind to play freely through a room a powerful ventilating effect is produced.

Window Ventilation.—Various arrangements have been proposed for utilizing the perflation of the wind. The windows of a room offer the simplest and most convenient means of securing this object. It has been advised, whenever possible, to have the windows on opposite sides of the room. These should be made to open at the top and bottom. If the top sash be lowered and the bottom sash raised, the warm air will pass out above and the cool air enter below.

Fireplace Ventilation.—The open fireplace forms a simple and most efficient outlet for ventilation; in fact, if proper inlets are provided no other form of outlet is required in dwelling houses. The open fire extracts the air from a room with great rapidity and causes an active circulation of air. The heat is obtained by radiation from the glowing coals and by radiation and reflection from the different parts of the grate. The air in the room is warmed by the fire first warming the walls, ceiling, floor and articles in the room, and these again warm the air.

Heating.—Heating appliances vary from the old log chimney fire to the modern steam heat. Fireplace heating is always to be commended both for its cheerfulness and healthfulness, and that whether the fuel be wood or coal. The open grate is the fireplace heater in modern dwellings in both city and country. In cities gas offers an agreeable substitute for coal and wood.

The Stove.—The next most agreeable and more effective heating apparatus, especially for the country, is the stove. These are now of infinite variety. They serve the double purpose of radiating heat and of giving a degree of ventilation.

Other Heating Apparatus.—Heating by cellar heaters and by steam-pipes is efficacious in the respect that heat can thus be diffused through the whole house. But there is no ventilation nor cheer connected with the systems, and they are, as a rule, expensive.

PART III.

LIGHTING.

Production of Light.—Artificial light is produced by heating some body to such a degree of temperature that it becomes incandescent. The color of light which a heated body gives off bears a certain relation to the degree of temperature. In producing artificial light the object is to obtain a temperature that will give off as large a per cent. as possible of those rays which are perceived by the sense of sight.

Nature of Illumination.—Until quite recently, artificial illumination was obtained through heat developed by chemical action, usually called combustion. Combustion is a process of oxidation, the chemical action being between the burning body and the oxygen of the air.

Materials of Light.—The materials of ordinary light are mainly carbon, with a certain degree of oxygen and hydrogen, and the process of combustion is one of rapid, even violent, oxidation of the carbon and hydrogen by the aid of the free oxygen of the air.

Phenomenon of Light.—Luminosity of light is due to the high temperature reached by the hydrogen and carbon, or hydrocarbons. The hydrogen has a greater affinity for oxygen than the carbon has, and consequently takes up the greater proportion of the oxygen surrounding the flame, producing intense heat, and separating the hydrocarbons which are in a state of dense vapor. Being intensely ignited in the hydrogen flame, the hydrocarbons become brightly luminous. Thus ordinary illumination has the disadvantage of extracting oxygen from the air, setting free carbonic acid gas and producing heat and certain products of combustion, which are calculated to vitiate the air of dwellings.

The Electric Light.—This light is not a product of combustion, but of an electric current passing through a resisting medium, as a gas, small wire, or carbon candle or filament. When a carbon filament is used it must be protected in a vacuum in a sealed glass globe. This is the so-called and familiar incandescent light. The electric arc light is produced by passing an electric current through carbon candles, whose tips are nearly touching. At the break a brilliant light appears. It is the favorite street and store light of our day.

Advantages of Electric Lights.—It is the cleanest of all lights. It produces no heat and has no effect on the gases of the air. It consumes no oxygen and gives off no impure compounds. With the discovery of how to make it economically it speedily succeeded all other kinds of light in large city houses and for street and area purposes.

Ordinary Lighting.—Sources of artificial light in common use are gas, mineral oils, solid and liquid fats, the latter employed in the form of candles and lamps.

Gas Light.—This is still largely used in cities and towns of some size. If properly made it is economic, cleanly and convenient, but otherwise its products of combustion are ruinous to furniture, books and health, and call for a thorough system of house ventilation.

A Ventilating Apparatus.—A ventilator for gas impurities consists of openings in the ceiling above chandeliers and burners leading into a tube of tin or zinc, which is carried beneath the floor of the room above and thence into a chimney or foul-air shaft.

Gas Lighting.—This common mode of lighting in cities and towns has its conveniences and dangers. Its greatest merit is convenience. It does not rank as an economic light. It can never be classed as a safe light.

Petroleum.—Petroleum, or kerosene, ranks next to gas as an illuminant. It was at first dangerous, but since the "flashing point" of kerosene has been ascertained, and laws have been enacted as to refining processes, the danger has been greatly reduced. Moreover, there has been a great improvement in lamps, so that now kerosene ranks as the favorite rural light.

Candles.—Candles as illuminants have been almost wholly superseded by gas and petroleum. Their use has little effect in determining the amount of air required for ventilation.

Effects of Combustion.—As regards the effects of combustion of lights upon ventilation, experiments have been made to determine the relative quantity of carbonic acid generated by different agents in producing uniform illumination. According to Douglas Galton, several kinds of lights were burned in given quantities of air, and the times at which the flames went out were carefully noted with the following effect:

Colza oil	71 minutes
Tallow	75 minutes
Wax candles	79 minutes
Spermaceti candles	83 minutes
13-Candle coal gas	98 minutes
28-Candle cannel gas	152 minutes

It would appear from the above experiment, that coal gas required a longer time to vitiate the atmosphere of a room than any form of candles, or colza oil, which is an oil expressed from rape seed combined with other vegetable oils. According to Roth and Lex, petroleum produces a less quantity of carbonic acid than gas, the amount of light being equal. It must be taken into consideration that when candles and oil are used, a less illuminating effect is satisfactory, and therefore, in practice, the contamination of the air by these agents seldom ever reaches that produced by burning coal gas. When petroleum is burned in large quantity, there is, of course, the same necessity for providing a means of escape for the products of combustion as exists in the case of coal gas illumination.

Lights for Reading.—For writing or reading or other close work it is important that the light should be of sufficient quantity, steady and uniform, and so arranged that it shall come from a little above the eyes and from one side. For writing, it is usually arranged a little above the left front of the writer. When two lamps are used, they may be placed one on each side of the worker, so that the light shall come from above the level of the eyes.

Outlets for Products of Combustion.—The electric light, gas light and kerosene light hold the prominent place in lighting by reason of efficiency. With the moderate use of any of these illuminants there need usually exist no necessity for special outlets for removing the products of combustion, if the ordinary means of ventilation are properly applied. But where a large number of lights are required and are habitually employed, special provision should always be made for the escape of the resultants of combustion, and, preferably, such as will also afford channels of escape for the vitiated air of the room.

PART IV.

WATER SUPPLY.

Importance of Water.—Water being a prime necessity of life, a universal diluent, an agent of cleanliness, its supply and quality become objects of supreme importance to the comfort and health of man. An insufficient supply leads to impurities, and the latter to disease. Any community will be sickly where water is scarce and impure.

Water Impurities.—Mineral matter in water, if excessive, renders it hurtful. Decomposed vegetable matter is a source of dangerous impurity. But the most dangerous impurity is excremental matter from animals and diseased persons, and the sewage and refuse from towns and factories. These infect entire rivers upon which cities depend for their water supply, and often breed typhoid and other epidemics. So insidious is this kind of water infection, that it is almost impossible to correct it by sedimentation, or even by filtration, unless great expense is incurred.

Quantity of Water Required.—Just how much water a household requires in a day is an open problem. More is required in cities than in rural districts for each individual of a family. Waste is also greater in the city than in the country. It is estimated that in the city a comfortable supply of water for domestic purposes would reach twelve gallons per day for each person. This embraces the amount necessary for drinking, cooking, washing of person and clothes and the house utensils. Double that quantity would be required if the water for baths and water-closets be considered.

Average of Water Required.—A healthy adult requires, on an average, about half an ounce of water daily for every pound of weight of the body. One-third of this weight is contained in the foods taken. The rest must be supplied by drinking of tea, coffee or water itself. This quantity varies according to age, sex, weight, temperature and occupation.

Sources of Water.—Rain is the great source of water. It feeds springs and rivers, cisterns and reservoirs. If carefully collected in the open country it is the purest of waters, yet at times is far from being pure, for if the air through which it descends be loaded with gases, acids and salts, as is frequently the case near cities, rain water is sure to be infected. So rain water collected in cisterns may be befouled by soot, bird excrement, leaves, dust and other impurities washed from the roof.

Ice and Snow Water.—These waters, especially the latter, are largely used for drinking purposes. Freezing has a purifying effect on water, but when impurity is rife in water it defies the purifying process of freezing and enters the ice to make it a dangerous source of disease. Snow water is not, as a rule, considered wholesome on account of the carbonic acid it usually contains.

Spring and Well Waters.—Rain water, in passing underground, is liable to become vitiated by the character of the soils it passes through. It may in its course suspend vegetable, mineral or animal matter, gases of various kind, solid matter like lime, magnesia, iron, and so forth. Water which percolates through hard rock formations is generally pure. Granite, trap, slate, and hard grit waters are generally pure. Sand and gravel waters are variable, some being very pure, others not so. Chalk waters are generally pure, but hard. They may be improved by boiling. The same may be said of limestone waters.

Surface Waters.—These, as a rule, are impure, and yet many marshes, like those of the Dismal Swamp and the Cedar Swamps of New Jersey, contain very pure water.

Temperature and Quality of Water.—The quality of water is influenced more by the strata through which it passes than by the depth of the spring or well; but depth influences the temperature of water, for the temperature of water of shallow springs or wells varies with that of the atmosphere, while that at greater depth maintains the temperature of the locality all the year round.

Spring Water.—Spring water is commonly depended on in the country for ordinary purposes. Though spring water, especially when drawn from deep sources, is usually considered pure it should nevertheless be tested, since mere depth is not always a guarantee against impurities.

Well Water.—The well is another common source of water supply in the country. It is not as safe a water as that from the spring for it has not the same free and constant flow and it is therefore more exposed to the danger of contamination. Tests should be applied to well waters at least once a year, especially if the surrounding soils be porous, or privies or cesspools be contiguous. The deeper the well the less danger there is from impurities by percolation.

Roof Waters.—In some sections the cistern is depended on for water. In such cases the roofs and spoutings should be well looked to. Roofs, through their materials or through the use of paint, often seriously affect the quality of rain water. Spoutings also may render water impure either through the lead used in their construction or by becoming clogged. The cisterns themselves should be often cleansed, for no matter how pure the water may be with which they are fed there is no circulation in them and consequently always an injurious accumulation of sediment at their bottoms.

Artesian Wells.—These, from their great depth and constant flow, furnish the most wholesome water supply obtainable. They are made by boring into the ground to a great depth until a layer of water is reached, which is retained beneath an impervious stratum under pressure. When this stratum is penetrated the water rises to the surface, sometimes with great force. Water from such a source will naturally be free from impurities resulting from the decay of animal or vegetable matter.

River Water.—Water of rivers and streams is a common source of supply, especially for cities or towns. River waters vary in their compositions according to the variety of their sources. They are, as a rule, softer than spring or well waters, but are often contaminated with liquid and solid refuse of various kinds due in too many instances to sewage. Though water tends to purify itself in flowing a distance of several miles, no great confidence can be placed in this process of purification of water known to be seriously polluted. The only safe course is to prevent the pollution or abandon the source of supply.

Quality of Water.—It is very difficult to define a wholesome water, but the general characters that such a water should possess are easily enumerated. They are perfect clearness; absence of color; freedom from odor and from taste (that is to say, neither salt nor sweet), good aëration; freedom from deposit on standing, and a moderate degree of softness. But a water may have all these characters and yet be unfit to drink on account of the presence of dissolved matters which it is not possible to detect except by chemical analysis.

Palatableness of Water.—A water may be palatable and at the same time be unwholesome. The following table will serve to illustrate this fact:

Wholesome ...	1. Spring-water	Very palatable.
	2. Deep well-water	
	3. Upland surface-water	Moderately palatable.
Suspicious	4. Stored rain-water	
	5. Surface-water from cultivated land	Palatable.
Dangerous ...	6. River-water to which sewage gains access	
	7. Shallow well-water	

Hardness of Water.—Water is spoken of as being hard or soft. The hardness of a water is generally due to the presence of the compounds of lime or magnesia. Hard water gives a peculiar sensation of roughness when the fingers are moistened with it and rubbed together and it does not easily make lather with soap. Soft water feels smooth to the touch and readily dissolves soap. If ordinary soap be added to hard water the mineral salts in the water decompose the soap and form insoluble compounds, which give to the water its curly appearance. Hard waters are supposed to iriitate the stomach, and when they contain an excess fo calcium and magnesia sulphates, may cause irritation of the bowels and produce diarrhœa in persons accustomed to soft waters. Gravel and stone in the bladder have been attributed to the use of hard water; an sdo also have swellings of the glands of the neck, as goitre, for example, when the hardness is due to the presence of magnesia salts.

Boiled Water.—Boiling reduces the hardness of water and helps to deprive it of other forms of impurity. It is a good plan to boil water wherever there is a suspicion of impurity. The flat taste of boiled water may be relieved by pouring the water from a height from one vessel into another.

Pollution of Wells.—The water supply of rural and suburban districts is constantly liable to pollution from all sorts of impurities coming from dwellings. The most frequent and dangerous source of contamination is the cesspool or privy-pit. People seem to forget that the property of the soil that permits them to conveniently get rid of liquid excreta, house and waste water is that which enables the rain to supply their wells with water; and when a cesspool is placed near a well its liquid contents may reach the well through the same channels that the rain does.

The Cesspool Nuisance.—To prevent contamination of the water-supply the leaking cesspool should be abandoned and some form of dry removal substituted in its place. Earth-closets or water-tight tubs or boxes for solid and liquid excreta will answer the purpose provided they are properly made and adjusted, and frequently removed. The wells should be protected from soakage from the surrounding soil by a proper lining of impervious material. Shallow wells are always more or less liable to pollution and should be abandoned wherever practicable and the deep well or driven well substituted.

Polluted Water and Disease.—Diarrhœa, typhoid, cholera and kindred diseases are very frequently traceable to polluted waters. For a full explanation of this subject see the article in Book III., on "Water in its Relations to Health."

Tests for Water.—Regular chemical tests of water are, of course, the best, but the following may be applied without a knowledge of chemistry:

If chlorine is present in considerable quantity it is due to impregnation of sea-water or to strata containing chloride of sodium or calcium, or to an admixture of liquid excrement of men or animals. If not due to the first-mentioned sources its presence should give rise to suspicion of sewage impregnation. If a few drops of a solution of nitrate of silver containing a little nitric acid be added to the suspected water a slight haze will be produced if only a little chlorine is present; but if there is much a marked turbidity will result which will change to a lead color. A solution of permanganate of potassium may be used to determine the presence of organic matter. If a few drops of such a solution is added to the water it produces a pinkish color which should remain sometime if the water is reasonably pure. If the color rapidly disappears it indicates excess of organic impurity, probably animal organic matter. Nichols mentions a test for sewage contamination, proposed by Heisch, which is as follows: "Place some of the water—say half a pint—into a clean, colorless glass-stoppered bottle, add a few grains of white sugar, shake until the sugar has dissolved and leave the bottle freely exposed to the light in a warm room for a week or ten days. If the water becomes turbid it is open to suspicion of sewage contamination; if it remains clear it is probably safe."

Other Tests.—Some information of the quality of a water may be obtained from an examination of its physical characters. Its smell, taste, color and transparency will give some indications of the quality. A good water should be perfectly clear and contain no suspended matter or sediment. It should be colorless and free from odor or taste. It should be bright and sparkling, showing that it is well aërated; and it should have a certain degree of softness, so that cooking operations can be properly performed. It should be remarked that a water may possess all these qualities and yet not be free from danger. On the other hand it may be said that if all these qualities be present in a water, the chances are greatly in favor of the water being pure and wholesome.

PART V.

REMOVAL OF REFUSE.

The thorough removal of refuse matter, solid and liquid, from buildings and their vicinity, is indispensable to healthy life. Neglect of this is a cause of a vast number of preventable diseases.

Why Filth Produces Disease.—Accumulations of filth about houses taints air, water and soil. Septic particles, or ferments, given off in the putrefaction of organic matter, evolve the seeds of many diseases. Typhoid and enteric fevers are thus engendered. Privies and privy drainage and soakage have given rise to typhoid epidemics. Cholera, dysentary and allied diseases spring from the same source. Many other diseases owe their origin to filth poisons. Many suppose that consumption may be due to filth particles. Filth is the breeding place of the germs of diptheria and other fatal diseases.

Safety in Cleanliness.—All refuse matter calculated to poison air, water or soil near a dwelling should be sedulously removed. This necessity exists everywhere, in city as well as in country.

Sources of Air and Water Pollution.—Nuisances traceable to air and water pollution are:

1. Defects of public sewerage.
2. Defects of house drainage.
3. Faults of cess-pool arrangement. No cess-pool should exist as a simple hole in the ground. It should be walled or bricked dry, and the bottom laid similarly. It should be frequently cleansed. No wells should be near it.

House Drainage.—Every house drain should insure the removal of all liquid refuse, waste-water and fecal matter, without leakage. The pipes should be of iron or earthen ware, for at least eight or ten feet distant from the house; but if a spring or well be near the piping should continue far beyond it. All pipes should be laid in a bed of clay, and the joints firmly cemented. Cement beds for pipes are the best.

Flushing of House-Drains.—All house-drains should be occasionally flushed by pouring large bodies of water into them. Field's flush tank is used for the purpose of flushing drains in the country.

Rain-Water Leaders.—A convenient plan of disposing of rain water is to pass it through the drain pipes. This affords an excellent flush, but care must be taken against freezing in winter; all conductors of rain water should be kept outside the house, lest the back gases should enter the house.

Dry System of Removing Excreta.—The dry system is adapted to towns and villages and to single cottages. It consists in the admixture of dried earth, coal ashes, or other dried refuse, with the excrement in sufficient quantity to absorb and reduce it to an inodorous form. The absorbent material must be perfectly dry, and must be applied immediately, and in sufficient quantity to cover the excretions and remove all fluidity. All slops and sink water and solid matter must be carefully excluded. In rural districts this plan can be made very satisfactory, but in towns it is seldom that the removal takes place sufficiently often to meet the requirements of the case. The receptacles should be made of impervious materials, and the closet should be located either out of doors, or in an isolated part of the building, or in an apartment projecting from the house. The apartment should be well ventilated.

The Earth-Closet System.—Moule's earth-closet system comes under the head of the dry-removal systems, and is the plan with which the public is most familiar. On account of the absorbing and deodorizing qualities of dried earth, this substance is selected for use in closets, especially within the house. The original apparatus, designed by Mr. Moule, consists of a wooden box divided into two main compartments. The lower one contains a receptacle or pail for the sewage, and the upper one the reservoir or hopper from which the dried earth is supplied in requisite quantity whenever the closet is used. The hopper in the upper part of the apparatus is capable of holding an ordinary coal-scuttle full of earth. A plug is attached to its outlet, and is operated by a lever connected with a handle. Beneath the seat is a guard, which directs the dried earth into the pail without allowing any of it to escape at the sides.

Book VII.

PHYSICAL EXERCISE AND CULTURE AND THEIR BEARINGS ON HEALTH AND STRENGTH.

PART I.

GENERAL INFLUENCE OF EXERCISE.

Heart and Blood.—While the heart, the hollow muscle which propels the blood to all parts of the system, is constantly in operation during life, exercise can most powerfully modify its action. One can see for himself that exercise drives the blood more forcibly to the skin. The cheeks redden because more blood flows through the capillary network, seen in the figure. The heat of the body is increased, and the appetite improved, indicating that new blood constituents are required.

Effect of Muscular Pressure.—Contraction of the muscles, especially of the arms and legs, exercise a powerful pressure on the blood-vessels. In the arteries it promotes the flow of blood onward toward the capillaries. In the veins it has a powerful effect in promoting the return of the blood toward the heart. Moreover, limb movements alternately lengthen and shorten the extensible veins and thus operate as a kind of sucking force within.

A Network of Capillaries.

Special Results of Exercise.—It is further possible to regulate by bodily movements the supply of blood to each particular organ. Influx of blood to a particular organ, when superabundance might prove dangerous, can be relieved by movements calculated to carry it to parts where no harm can come. This is particularly useful in certain forms of heart disease.

EFFECT OF EXERCISE ON THE LUNGS.

Importance of Respiration.—The importance of full and free respiration, by which an ample supply of fresh, pure air, rich in oxygen, is taken into the lungs, and much waste matter carried away, cannot be overestimated. Deep and calm is preferable to rapid and superficial breathing. The former indicates healthy lungs, the latter indicates weakness.

Exercise and Respiration.—During and after exercise respiration is both frequent and deep. The increased quantity of air inhaled and exhaled carries to the lungs an increased supply of oxygen, and carries away carbonic acid and other waste products.

Effect on the Chest.—A wide, deep and mobile chest is a sign of strength in the respiratory organs. This chest is seen in soldiers, laborers, sailors and in all who use gymnastics in a rational manner. It contrasts most favorably with the narrow, hollow and almost motionless chest of those of sedentary habits, or who neglect exercise.

Respiration and Blood Circulation.—Respiration also contributes proper blood circulation. The lungs, by their great elasticity, react on the air inside of them and shrink from their surroundings. This diminishes the pressure of air in the lungs upon the arteries and great blood-vessels, and consequently produces a suction in the large veins toward the heart. This diminished pressure powerfully promotes the rapid emptying of the blood from the veins into the heart. In a word then, exercise develops the muscles of respiration, and by the energetic action of these strengthened muscles the entire circulation is invigorated and a more active interchange between the inhaled and exhaled air is brought about.

INFLUENCE OF EXERCISE ON DIGESTION.

Relation of Exercise to Digestion.—The relations of exercise to digestion are very important. A due amount of active muscular exercise seems to be indispensable to healthy digestive organs and easy digestion. One of the most serious forms of dyspepsia is due to the feebleness of the muscular movement of the stomach, which movement produces the churning motion so essential to digestion.

Strong Abdominal Muscles.—It is anatomically true that strong abdominal muscles are generally found with good digestion, and weakness of these muscles accompanies feeble digestion. Bodily exercise is the best sauce for food. Hunger aids a strong efficient digestive apparatus.

Exercise and the Secretions.—Rapid and complete throwing off of waste matter from the system is as important to health as an ample supply of food. Exercise increases the circulation in the small arteries, causing augmented transudation of nutritive material to fill the interspaces of the surrounding textures. It also diminished the blood pressure in the smaller veins, thus facilitating the absorption of the waste matter from the interspaces of the tissues. In the same way the decreased pressure of blood in the minute veins favors the absorption of a larger quantity of nutritive material, thus rendering the blood richer and more vitalizing.

Exercise and Organs of Movement.—Movement of muscles, even if it tires, increases their volume, showing that new substance has replaced worn out material, and corroborating the general statement that muscular action promotes increased growth by quickening the circulation, augmenting the absorption of nutritive material, and, in turn, improving the appetite. Muscular action develops the forces at the expense of nutritive material, but that is the very reason the muscles gain in bulk and strength. Exercise also develops the bones and ligaments.

Abdominal Breathing.—One should begin the inflation of the lungs at their base, that is at the abdominal portion, if the full benefit of lung exercise is to be obtained; to wit, a full, round chest and flat abdomen, which are sure criteria of health. Notice this, that when you expand the chest you draw back the abdomen. Notice, also, that when you draw in the abdomen the chest rises and expands. Thus there is mutual breathing by lungs and abdomen, a most important and strengthening exercise, one easily practiced, and bound to give the body a correct position and proportion. If there be a heavy, distended abdomen, one out of proportion to the rest of the body, and often unsightly, this mutual breathing exercise will reduce the unsightliness and contribute to symmetry of parts.

Exercise and the Nerves.—Nervousness is very common among those who do not daily subject their muscles to a sufficient amount of exercise. They get headache, faceache, pains in the back, neuralgia, dyspepsia, differ from heart palpitation, noises and changes of temperature, grow irritable, lack energy and perseverance. It is known that a nerve left in prolonged inactivity degenerates, becomes relaxed and feeble. Hence the necessity for such exercise as will make it demand nutrition and grow strong.

Exercise and Mind.—Proper exercise of the mind is just as necessary for its health as that of the body. But unfortunately the mind is apt to be overexercised, especially with children and modern systems of education. Overwork of the mind, even if it be called education, and neglect of physical culture is vicious in every way. The nervous apparatus, and more especially the brain, is the organ of mental powers. Just as the perfection of physical life is dependent on proper exercise of the organs, so the mental capacities in a healthy body are kept efficient by proper employment.

Appreciation of Exercise.—Perhaps one reason that systematic exercise is not appeciated at its full value is that its special object and nature, its adaptation to individual requirements, and its effect upon the different structures of the human frame are imperfectly understood. This arises from the fact that its effects upon any part but the muscles are seldom taken into consideration, and hence its vast influence on the organs employed in the vital processes of respiration, circulation and nutrition is overlooked. The evils arising from this mistake are many, for so long as it is popularly thought that systematic exercise gives nothing but muscular power, few of those engaged in intellectual pursuits, to whom sheer muscular power is of little account, care to cultivate it.

Will-power.—It should never be forgotten that the results of exercise, or physical culture, are not by any means limited to the body. They embrace the will-power and also numerous moral qualities. These need to be called into requisition with every physical effort, and this constitutes their exercise and constant strengthening and growth. Exercise of will-power, in connection with bodily exercise, soon gives the former such control that without active physical exertion, but simply by will-exertion, muscles can be used and developed to an unlimited extent. This strengthening of will-power not only means health of body, but success in life. With will-power fully strengthened goes the kindred quality of self-control, a prime helper toward the completion of the perfect man, not only as to physical proportion, but as to all the qualities classed as intellectual and moral.

Time Required.—Once develop strong limbs and a shapely frame, and a very little exercise comparatively will keep them so. Get the vigorous heart and ample lungs, set in a fair proportioned and ample chest and but a small fraction of the time spent in carefully regulated exercise will

EUGEN SANDOW, the premier example of Physical Culture.

WHEN THE DOCTORS FAILED.—A New York boy, thirteen years, whose health had given his parents considerable trouble. At the age of twelve his life was despaired of. He is now on the road to become a strong and robust man.

ONE OF MANY.—This gentleman has been following the Physical Culture exercise for a little over a year. He shows the splendid development of the system.

HEART TROUBLE CURED.—This picture shows a remarkable improvement made in three months, having increased his chest 3½ inches; upper arm, 1½ inches; forearm, 1 inch; thighs, 1½ inches; calf, 1 inch. In addition he has been cured of heart trouble.

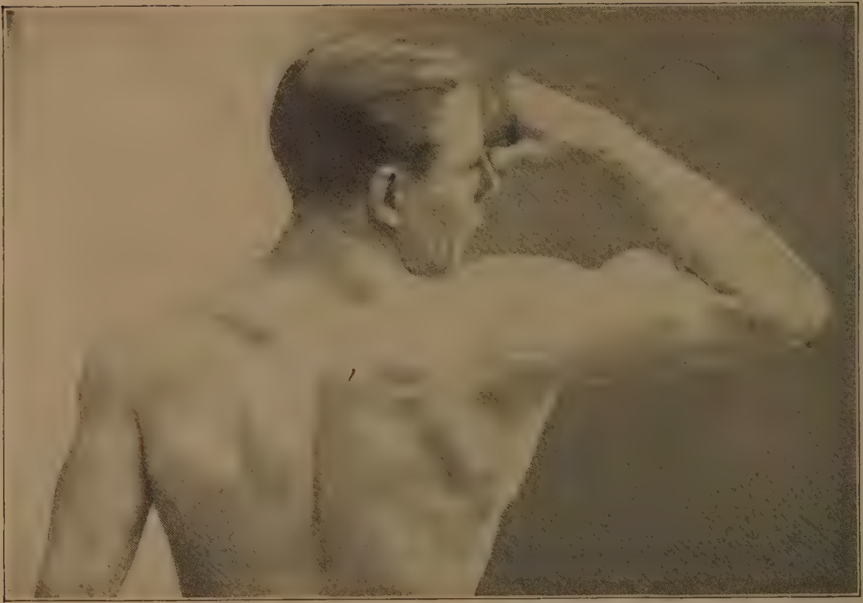
HEALTH REGAINED.—This figure shows the remarkable building up and increase in health after three months' experience with the system.

ANOTHER EXAMPLE OF THE SYSTEM.—This pupil has paid particular attention to lung and chest development for the past twelve months, and is an example of the success of the system.

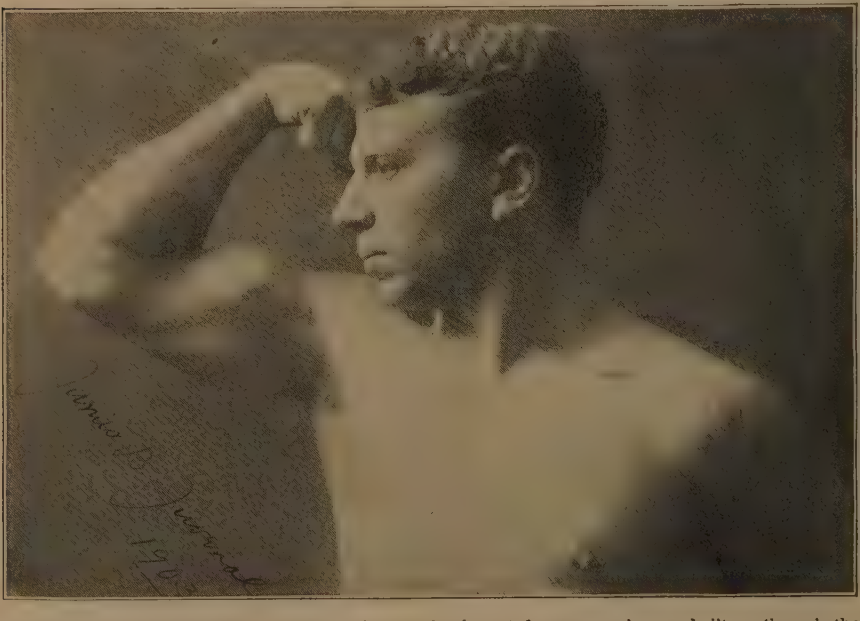
CHEST DEVELOPMENT.—This pupil shows splendid arm development for six months' exercise, and is now starting chest development.

DEVELOPMENT AND IMPROVEMENT.—This pupil has made the following improvement in development in six months. Increase: Chest, 4¾ inches; upper arm, 5 inches; forearm, 2½ inches; waist reduction, 3 inches. Other improvements in proportion.

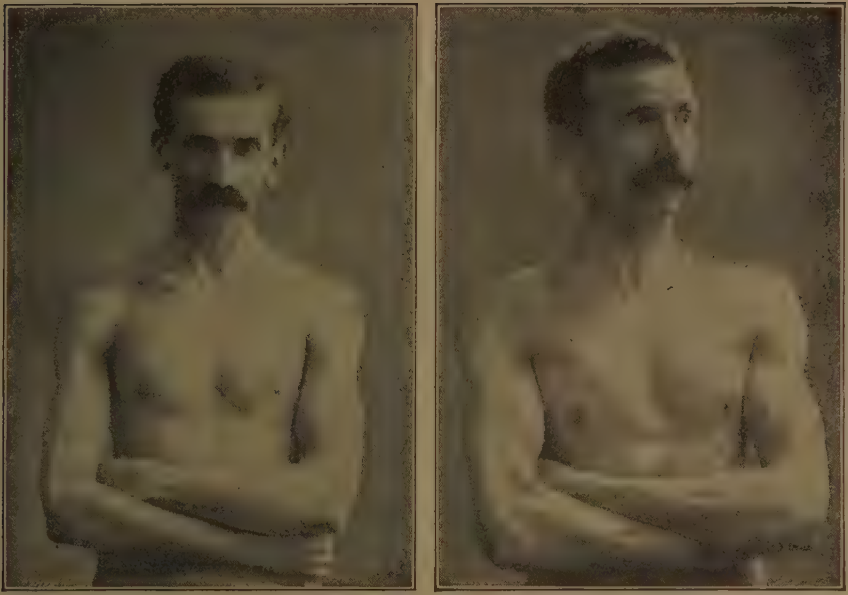
AN INTERNATIONAL EXAMPLE.—Sandow at the age of 19.



WHAT FOUR MONTHS WILL DO.—This Chicagoite has followed the system for four months, and shows remarkable development of all muscles.



NOW A NOTED OARSMAN.—This is a photograph of a noted oarsman who was built up through the system of Physical Culture.



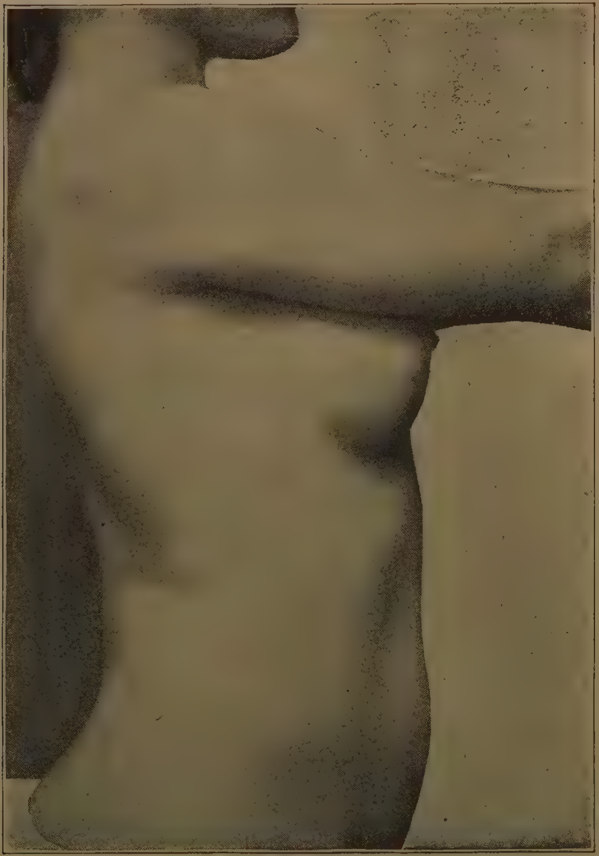
A CONSUMPTIVE CURED.—Two pictures of a pupil who was a consumptive before taking up Physical Culture. Plate A shows him before treatment and plate B three months later. Note improvement in face; also in neck and upper part of chest and arms. The doctor says there is no trace of consumption now.

WAIST REDUCED SEVEN INCHES.—A Philadelphian, 60 years of age, shows remarkable development. The system cured him of a long-standing indigestion and took 7 inches off his abdomen in three months.

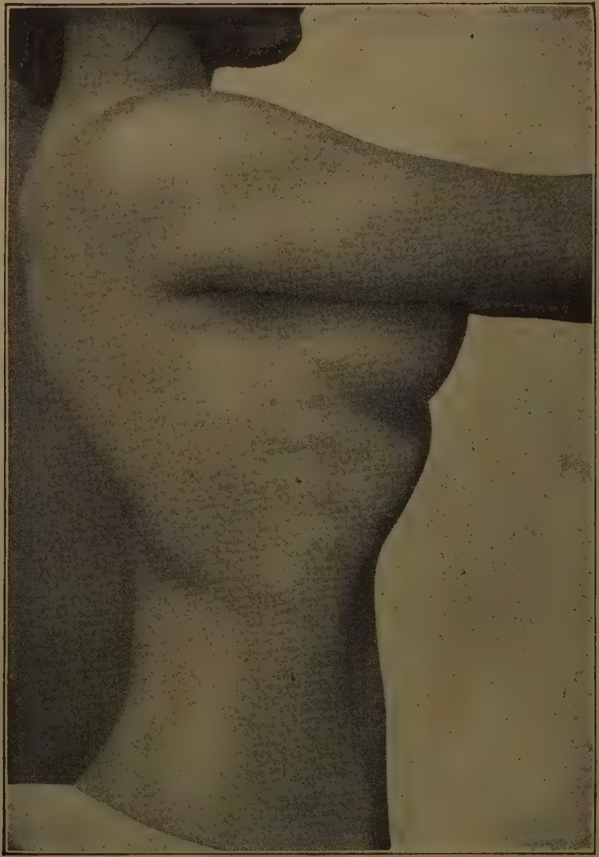
WHAT SIX MONTHS WILL DO.—A Philadelphian who spent six months in Physical Culture. He was very emaciated, and it was thought that consumption would overtake him. He is now in the soundest possible health.

TOOK PRIZE OF GREAT BRITAIN.—This young pupil won the third prize in competition recently for the most symmetrically developed man, open to the whole of Great Britain. Over 3,000 competed.

AN EXAMPLE OF ALL-ROUND DEVELOPMENT.—A Bostonian. This gentleman shows splendid, all-round development from the Physical Culture system, considering that he was only an average boy less than two years ago.

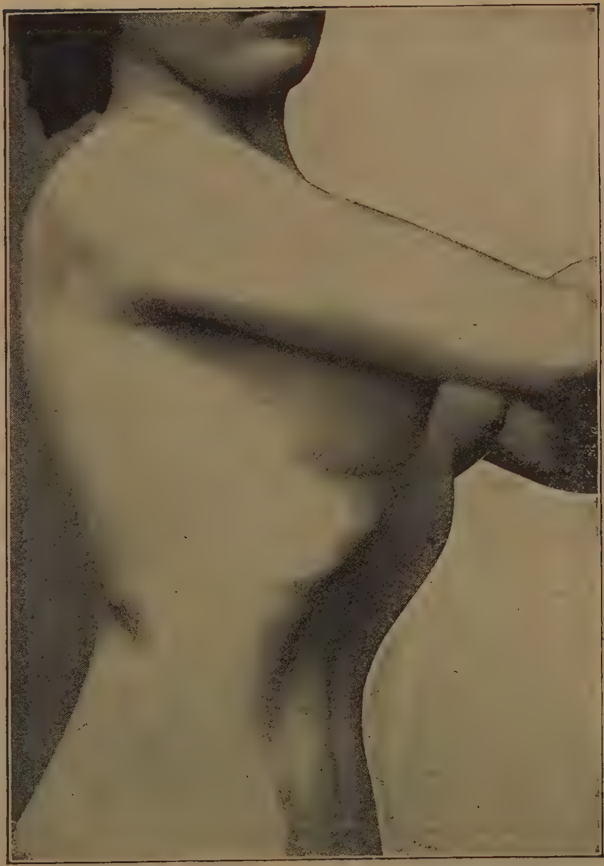


REMARKABLE DEVELOPMENT.—Figure of a pupil after one month's **exercise of Physical Culture.**



NO ARTIFICIAL AID NEEDED.—This shows the depth of chest, also the remarkable development. This lady exercised only fifteen minutes each **and every day, and does not now require artificial aid to make a good figure.**

WONDERFUL LUNG DEVELOPMENT.—A very powerful torso for a young girl; the width of chest indicates wonderful lung development, which means perfect health.



NO NEED OF CORSETS.—Same pupil after six months' exercise, showing great flexibility of abdominal muscles. No need of corsets here.

retain them in good condition. The portion of each day thus occupied need not be more than the busiest life can spare, nor in excess of that which the gravest mind would seek for recreation and recuperation. And that such results can be readily attained, may be demonstrated by reference to the recorded experience of leading teachers and disciples of the gospel of physical exercise.

Increase of Lung Capacity.—Dr. Morgan cites an instance of a hollow-chested and weak-lunged man who, by persistent systematic exercise extending over six months, increased the air capacity of his lungs from 250 cubic inches to 300 cubic inches. The value of this augmented lung capacity is inestimable. Suppose a man to be attacked by pneumonia, pleurisy or broncho-pneumonia, it may be readily conceived in such an emergency the possession of enough lung tissue to admit forty or fifty additional inches of air will suffice to turn the scale in favor of his recovery.

Lung Function.—Perhaps it is not generally known that only about one-third of the lungs is brought into play in ordinary breathing. Rest assured the other two-thirds will be called into requisition some day or some hour, and therefore should always be kept in condition by proper lung exercises. The most important lung function is the elimination of the deleterious carbon-dioxide remaining after oxygen is extracted from the air. In active exercise one becomes breathless and exhausted. This is because the one-third of the lung power is not equal to the task of throwing off deleterious accumulations. Now it is that the other two-thirds are called into requisition. They must be in condition to act promptly and efficaciously. Hence the importance of daily, systematic and full lung exercise. It is as essential to health as eating and sleeping. This fact will be soon learned after sufficient trial, for the whole man will soon respond, deep, easy and satisfactory breathing will ensue, and the revelation will be surprising.

Evils of Too Little Exercise.—The gradually increasing failure of muscular power observed when neglect of proper exercise is persistent, is the result of microscopic changes in the structure of muscles involved, during which some of the materials of construction disappear and are substituted by powerless and inert fat. This change of texture weakens the muscular fibres so that any sudden strain upon them might cause them to tear across. Such an accident, if it affected the heart, would prove suddenly fatal.

Fatty Degeneration.—After middle life, when the period of decay commences, it can readily happen that a muscle which has undergone fatty degeneration in consequence of long disuse, may give way when called upon to perform some unusual feat. Thus, for example, a man of fifty, who, after years of sedentary life, makes an effort to throw a ball for a long distance, may be seized with a sudden sharp pain like the cut from a whip, and find the arm thus affected drop to his side entirely helpless. On examination a surgeon discovers that the biceps, or large muscle on the front of the arm, has been torn across, in consequence of its weakened condition, the result of fatty degeneration.

A Good Lung Exercise.—Stand erect and firmly, with the arms thrown back of the body. Inhale slowly through the nostrils, forcing the inhalations toward the last, until the lungs are filled with air. Keep the chest well thrown out to encourage expansion. Hold the inhaled air for a few seconds, then open the mouth and let the air exhale gently. To assist exhalation the arms may be brought forward of the body and the chest allowed to assume its normal position. This exercise should take place only in the open air or where the air is pure, and may be safely indulged in from two to three times a day. A gentle patting of the chest muscles assists their development.

Children's Deformities.—One of the most common deformities among studious youths is stooping, by which is meant the habit of carrying the head and neck, as well as the upper portion of the trunk, bent forward, so that they are not in a line with the rest of the column of the body. A most evil consequence of this position is the compression, resulting in contraction, or at least imperfect development, of the upper part of the chest. With this kind of deformity may be classed, as a more exaggerated form, the various species of spinal curvature, often due to weakness of the dorsal muscles or to inordinate or unregulated growth. Rapid growth in height, if unaccompanied by corresponding development, is not only a misfortune in itself, but the source of many other physical evils. Thus, for instance, we sometimes see lads at school growing at the rate of six or eight inches per year. Even the smaller of these additions to height, if so rapidly attained, is incompatible with fair development and robust health, because the whole formative power of the body is expended in furthering one process—that of upward growth. A marked phenomenon of his rapid increase in height is the scanty expansion of the chest which takes place during the process. A boy or girl who has thus "outgrown his strength," as it is frequently called, may exhibit a chest which runs up from the waist without any expansion whatever, whilst the shoulders fold round toward the front and the head stoops forward from the base of the neck, the spinal column seldom retaining its natural erectness. The thorax has even been known to actually diminish in circumference, as if it were tightened up by extreme elongation of the general frame. The true cause of these displacements is often, if not always, to be found in neglect of proper exercise for the muscles which hold the parts in their due relationship to each other. Dwarfed or stunted growth, and growing on one side, are distressing examples of imperfect development, which can often be cured or vastly improved by duly regulated exercise.

Evils of Overexercise.—Systematic exercise implies that no muscle or organ should be overtaxed or exhausted. An exhausted muscle has its nutrition seriously impaired, and it may take days to overcome the effect of twenty-four hours of overwork. Excessive exertion in walking, running or leaping is liable to bring on enlargement of the veins of the legs, and sometimes to produce hernia or rupture, especially in those with an hereditary tendency thereto.

PRIME ELEMENTS OF MODERN PHYSICAL CULTURE.

Essence of Physical Culture.—Some persons decry physical culture because they associate it with athletics, and by athletics they see nothing but brutal baseball, football and other like sports. A part should never condemn a whole. The above and all kindred sports have their place, and should be encouraged, in so far as they contribute to physical development, disassociated with their excesses. In this respect physical culture embraces them, but in this respect only, for it has far wider scope and loftier purposes than mere athleticism. The ancient Greeks indulged in athleticism, and wonderful stories are recorded of their feats in wrestling, running, jumping and throwing the discus. But in these exercises they sought more than personal triumphs. They sought to make a race of fine physical men, and thereby assure to their nation the possession and exercise of other qualities which would distinguish it, and make it potent in art, science, commerce and other possibilities. To them well applied the motto and principle of *sana mens in sano corpore,* a sound mind in a sound body. Physical culture was with them both a bodily and mental process or exercise, a blending of developments, a true, normal association of systems calculated to evolve the well equipped man. And so it should be to-day. So it is when physical culture is well understood and practiced. Its agents are manifold, and suited to every disposition and physical characteristic. There is no earthly excuse for anyone to neglect every-day cultivation of his body, and the consequent achievement of greater things in all the avenues of the wide world's work.

Uneven Development.—All special exercises should be regarded as part of general exercise, unless one be in training for a specific object. If exercise is specialized, when the above object is not in view, there is danger of developing a muscle-bound condition. All voluntary muscles of the body are in pairs. They oppose each other, and when one is used for effecting a certain motion, the opposite one is used for a counteracting motion. The biceps muscle of the upper inside arm is used for bending it at the elbow. The triceps muscle of the upper outside arm is used to straighten it out again. Now, if the biceps be developed by exercise at the expense of the triceps, it will grow so strong as to constantly want to perform its function, that is, of drawing up the arm. It is a law of physiology that a muscle thus in a state of contraction will gradually shorten. Its accompanying tendons will do the same. Eventually the arm will become muscle-bound. The development of the two important muscles of the arm—biceps and triceps—has been uneven, one at the expense of the other. The same may occur with any set of muscles. The condition is embarrassing, and contrary to all the laws of perfect development, and all the uses of healthy, natural and rational exercise. Competent gymnastic instructors watch such conditions, and provide means of overcoming them. But this is also possible with anyone. The best cure is to avoid them, by a general and even system of exercise.

Insomnia.—We have already seen the beneficial effects of exercise upon that distressing and all too common disease, dyspepsia. An allied, if not a consequent, disease, and surely one equally distressing, is insomnia—sleeplessness. It may not always be a symptom of definite disease, but it is almost surely an evidence of disturbed health, either physical or mental. The exceptions are those cases where there is suffering from intense pain, as of a wound or a toothache. Here the cause is plain, and the treatment equally so. But neither cause nor treatment is so plain in those cases of sleeplessness which are due to general disturbance of the system. To absolutely close the mind on retiring against everything but the determination to go to sleep has been proposed as an efficacious remedy for sleeplessness. But this requires an exercise of will-power often impossible, and especially at a time when will-power is at a discount by the very bodily conditions which provoke the insomnia. Moreover, it is contended that the mere fact of a determination to go to sleep will have the opposite effect.

A Physical Cure.—It is almost universally accepted that a good, if not the best, cure for insomnia is physical exhaustion of the body; that is, the bringing about of such a bodily condition as is best described by "tired," sufficiently tired to make one glad to lie down, and to feel that the best thing that could happen, or the only thing that could afford relief, would be a good, long, sound sleep. To bring about this physical condition, some prescribe a long walk before retiring, others a variety of exercises, but nothing answers better than a determined bout with the dumb-bells, forgetting everything but the effect of their use upon the muscles. The mind will thus be diverted, but in addition the exercise will relieve the gorged blood-vessels of the head and neck, a condition attendant on sleeplessness, and often the cause of it. When sufficient of this kind of exercise has been taken to divert the mind and tire the body, it should terminate in a sponging-down with cold water, and an immediate retiring to bed. The sponging should especially embrace the head, forehead and neck. If one is already tired by a hard day's work, and there be no further need for a course of exercise, the cold sponge bath may, of itself, prove all that is requisite. Should these fail of intended effects, resort may be had to a course of muscular exercises in bed. Extend and contract determinedly the muscles of the arms, then of the legs, and so pass over the whole muscular system, keeping the mind on the work, and remote from every source of worry. Add to the strictly muscular exercise any determined movement that may occur, such as turning the head and neck, raising head and body, stiffening out of body and limbs, etc., the mind always keeping pace with the motion. Insomnia did not come on you in a night or a week. You cannot cure it except by persistent battle.

The Bath and Exercise.—Apart from muscular development, the hygiene of exercise must always be considered. Exercise forces to the surfaces of the body the accumulated impurities, in the form of moisture and greasy substances. This it does even if the exercise has not been violent or persistent enough to induce perspiration. This moisture, if not removed by bathing, or by. persistent rubbing, will be re-absorbed and will return to the circulation. It is easy to see, then, that the bath should be counted on as an auxiliary to exercise, should complete the work of exercise. A person after exercising should wait to be cooled off sufficiently to enter a bath with safety. The best bath after exercise is the cold bath, that is one with a temperature below that of the body. Some hesitate to take this kind of a bath, but much of the hesitancy to taking it will pass away if one accustoms himself to taking it with a plunge, or, if the vessel be small, by a vigorous administration of the water to the body. It is unnecessary to say here, that this kind of a bath, indeed, all kinds of baths, should be followed by energetic rubbing. Thus do bathing and exercise unite in physcial culture, become adjuncts of one another, completing a system which cannot but contribute to both mental and bodily vigor and to longevity and happiness.

Age and Exercise.—Many indulge the delusion that exercise is only necessary to youth, the period when development is rapid, when exercise can be turned to the account of athleticism. This delusion is a fatal one to nurse, for exactly the contrary is true, as has been proved over and over again by personal experience as well as by medical observation. As middle life approaches or old age sets in, there is a disposition to quietude, to a relaxation of means of keeping the system in order. But these are the periods when the digestive apparatus is apt to suffer from impairment, and when the secretions and circulation grow sleepy and irresponsive. They are also the periods when the palate demands its luxuries, when the cigar or pipe habit has become fixed. All of these tend to produce conditions inimical to good health, and if indisposition or sickness does not set in, nevertheless, there is a premature drawing upon the vital forces, a wasting of what should be conserved for later years. Old age comes on before its time. The abatement of the natural forces due to years must, of course, go on, but it should not be hasty, and need not be if vital energy is properly preserved, which it can be if the physical machinery is kept in rational use. It must not be allowed to rust or go without oil. These can be obviated by exercise—not violent exertion, but systematic practice of rules suited to changed and changing conditions. Wonted exercise suited to younger years, if found too severe, must give way to something else better suited. What is momentous is that the habit of exercise should not be abated or lost. It is always necessary to health and prime physical condition, even after the Psalmist's range of years has been passed.

Food and Exercise.—No muscular exercise can be carried on except at the expense of tissue, just as there can be no steam-power except at the expense of coal. But do not forget that the prime object of exercise is to provide means for supplying more and better tissue, through the agency of oxygen and food, or, in other words, through fuller breathing, a greater need for food, and a better digestion and assimilation. Food, therefore, becomes a consideration in connection with physical culture. Nitrogenous foods are a prime essential. These consist of the meats, eggs, and leguminous vegetables. They supply the waste of tissue in an imperfect way, but when combined with the carbon-hydrates—sugar, starch, fat and salt—a powerfully stimulating food is provided, one in accordance with nature, and one calculated to restore tissue with great rapidity. Hence character and proportion of foods partaken of, especially in connection with physical exercise, becomes worthy of study. Indeed, foods in their quantity, kind and adaptation, like baths and other concomitants of bodily culture, are as momentous as exercise itself.

Exercise in General.—All bodily movement is exercise. Breathing, winking, any involuntary motion, is exercise. Voluntary motion, such as walking, typewriting, eating, is exercise. No action can take place without muscular movement. Even mental phenomena, such as fear, grief, pleasure, manifest themselves in muscular motion of the face, hands, arms, or other portions of the body. But exercise, as usually meant, is such action or movement of the muscles as is resorted to in the pursuit of health and strength.

Heart and Lungs.—Muscular action implies contraction and expansion. The central organ, the heart, the great provider of nourishment for the muscular system, should be regarded as the regulator and governor of exercise; that is, exercise should be in constant consultation with it, and should never unduly tax it. The lungs come next, and so intimately do they work with the heart, that they should never be imposed upon by violent exercise. Care for them will be better understood when it is known that no exercise would be of practical benefit unless the heart and lungs are allowed to supply their full quantity of oxygenized energy to sustain muscular activity. They have a most decided mission in aiding muscles to exude waste and the poisonous carbon-dioxide which exercise stirs and accumulates. Violent exercise causes the muscles to restrain the circulation of the blood. Hence blood cannot flow freely through the muscles to carry the waste matter to the lungs, there to be exhaled. So the muscle is deprived of oxygen. The worst is yet to come.

When the muscular restraint is removed by relaxation there is a sudden rush of blood to and from both heart and lungs. The heart is overtaxed. The lungs cannot sufficiently oxygenize the torrential inflow of blood. The blood passes into the circulation in an impure form. Great injury is done to the system. The desired benefits of exercise are lost. This is why excessive physical training, if long continued, or injudicious effort at lifting, running, leaping, etc., leads to heart, and sometimes lung, weakness.

It should not be forgotten that both these organs are at work all the time, not only helping us to live, but to perform our daily duties. If for no other purpose, they should be sedulously attended to. But in drawing on them for the extra power required for a course of exercise, how much more respect should be paid to them, and this especially since that quantity and quality of exercise which secures the evenest and completest muscular development, assist heart and lungs in the performance of their functions. No two persons are constructed alike physically. Hence the need of adapting exercise to physical needs. A rigid rule for one may be fatal to another. So no two persons are equally affected by their occupations. After a day's toil, the one may require light exercise, the other vigorous. Whatever exercise is chosen, it should be such as to conduce to free breathing—not overbreathing—and thereby to keep strain from off the heart. Heart-strain impedes blood supply. When heart and lungs are not a source of anxiety to one exercising, the mind, soul and entire will-power will be thrown into the muscular movements which one has chosen for his exercise. Dumb-bells afford excellent exercise to most anyone, but beginners are prone to the use of bells of too much weight. This is misdirected enthusiasm. It leads to harmful strain, if not directly of the arm muscles, at least of the tendons which carry the muscles over the elbows. The exercise becomes taxatious, and in proportion the breathing is restrained, and the heart overtaxed. Fatigue is felt, whereas exhilaration should ensue. What applies to the muscles of the arms applies equally to all the muscles of the body. When an exercise throws too much burden on the tendons, it should be modified or abandoned.

The need for everyone studying out for himself or herself a regime of exercise suited to his or her physical condition, occupation, time at control, and of persisting in it till satisfactory results are obtained, is as great as the need of preparing oneself for a buisness, profession, or any walk of life calculated to bring competency and happiness.

PART II.

GYMNASTIC EXERCISE.

Principle of Gymnastics.—The great principle of gymnastic exercise is the development of the body by special movements or apparatus particularly adapted for the purpose.

Harmony of Development.—It is obvious that by a complete series of appliances all portions of the muscular system may be judiciously invigorated, the result being an harmonious development of the entire frame.

Gaining the Object.—In order to make sure of the above object, it would be well for each one to study his weak spots and constitutional tendencies, that the right methods may be brought into play, at the right time and in the right way. The person should pass through a medical examination, and a trainer should be secured whose experience will prevent mistakes.

Bodily Tests.—In devising any system of examination, whether of individuals or classes, the aim is to establish the capacity of each person by a series of measurements and tests of strength, taken in conjunction with his family history, showing his vigor and weakness.

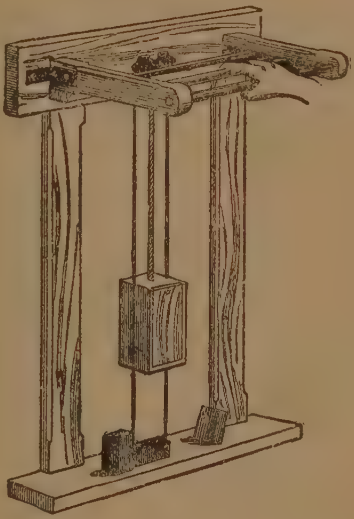
Tendency to Over-Exercise.—It is the fault of those who need and indulge in gymnastics to indulge it too much, or, at least, to bring into play the parts which are already strong. Such persons need to be guided and schooled, for they are not only developing parts which do not need it, but are neglecting the very parts that do. There can be no harmonious development in such cases.

Machine Tests.—Tests of strength are made in gymnasiums by certain machines. At the same time physical peculiarities are noted. After this the examiner can point out the man who is inclined to be pigeon-breasted, and prescribe the apparatus proper to be used. He can suggest to the man with weak lungs the use of the rowing machine. So he can instruct one with feeble heart to moderate work; can regulate the amount and kind of work for one of slow circulation and of a tendency to grow fat; can even point out the diet for rheumatic people, and the clothing for consumptives.

Repeated Examinations.—These tests should be repeated from time to time, and their results carefully noted, so that the degrees of development may be observed, and new courses of procedure prescribed, if necessary.

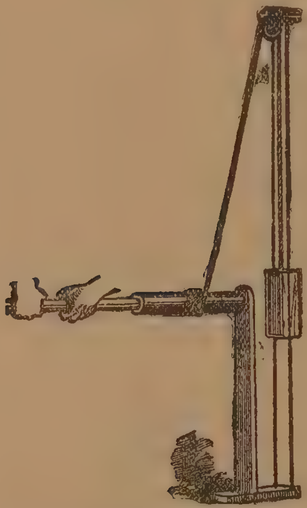
Gymnastic Machines.—Dr. Ford, of Philadelphia, has carried his gymnastic machines to great perfection. They are for the most part simple and can be readily constructed for home use by anyone with a little ingenuity. One of his machines is a lifting one, and is so arranged as to adapt the lifting power of the individual to his need of development along the lines most benefited by the lifting process.

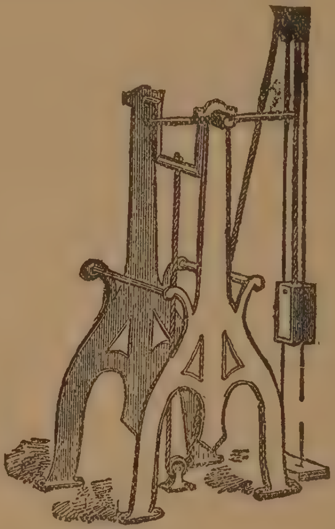
Improvement of the Flexors.—The adjoining figure shows a machine which may be constructed by anyone for home or school exercise. It is composed of a strong oak frame, from the upper part of which project two horizontal arms about breast high, united in front by a strong cross-bar. The inner side of each arm is grooved for a sliding frame connected behind by means of a rope over a pulley, with a box in which suitable weights are placed. The object of the machine is to exercise the flexor muscles of the forearm, and so improve the grip. In using it one or both hands are placed in the position indicated by the cut, and the weight lifted by the movement of shutting the fingers, as in clenching the fist.



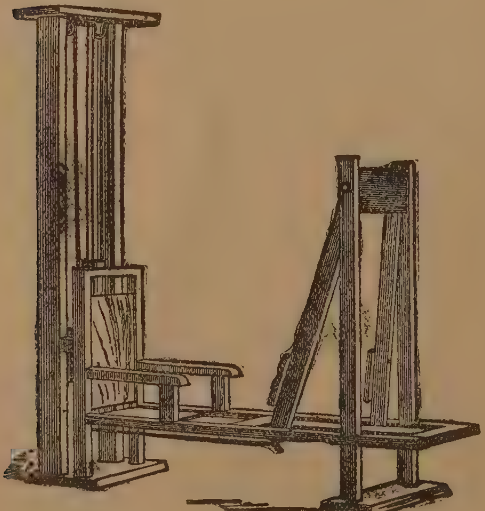
The Windlass.—The left-hand figure is also an apparatus for strengthening the wrists and muscles of the forearm, and of the arm proper to the shoulder. It is a smooth, round wooden bar about an inch and a half in diameter, and so arranged as to revolve rapidly. As it rotates it coils a rope around its thicker portion, which raises a box containing weights sufficient to produce a due amount of fatigue in the forearm muscles of the learner. **(For figure, see next page.)**

Right-Hand Figure.—The figure to the right is for the development of the upper arm, shoulder and chest muscles, and is especially valuable to those who have inherited a consumptive tendency. It is a stout frame, with sockets near the top for a metallic axle, operated by a cross-bar, so as to lift the weight supported by a rope passing over two pulleys. On account of the short arm of the lever the pupil's strength is taxed to rotate the cross-bar, and the muscles are correspondingly exercised. As practice goes on the poundage of the weights may be increased. Proper postures of the body should be carefully observed in this exercise.





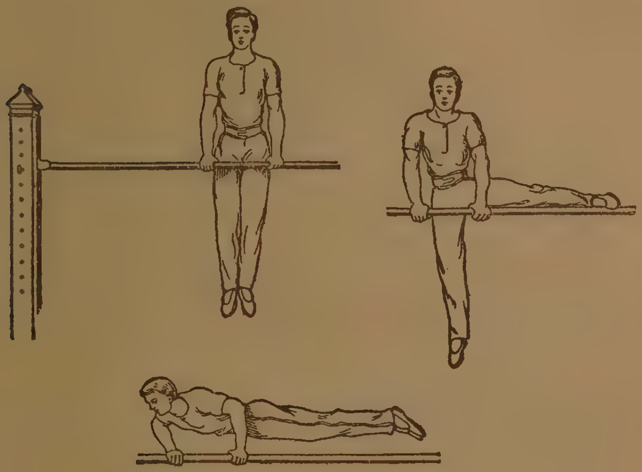
Dr. Ford's Gymnasium.—Dr. W. A. Ford, of Philadelphia, has carried the variety and construction of gymnastic apparatus to great perfection in his gymnasium. His appliances are all based on perfect development of the body, part by part, and according to ascertained rules fitted to weak and strong bodies, and to various conditions of life.

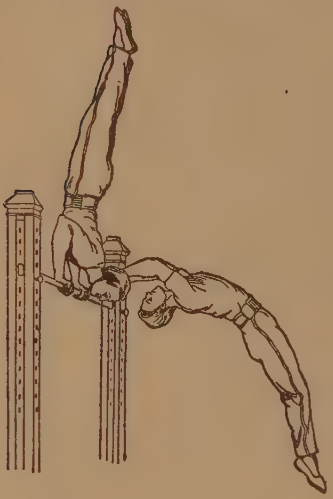


Lower Extremities.—Among Dr. Ford's appliances is an ingenious machine for developing the lower extremities. It consists, as seen in the adjoining figure, of a chair in which the pupil seats himself, rests his arms upon its arms, and grasps the extremities firmly.

The feet are then placed on the treadles, which are so connected by ropes passing over the pulleys behind and above the chair that extending the legs lifts the weight-boxes, which are loaded to any desirable extent. The exercise may be varied by pushing out the feet alternately, or together, or by making the leg extensions on each side in groups of two, three or four, as preferred.

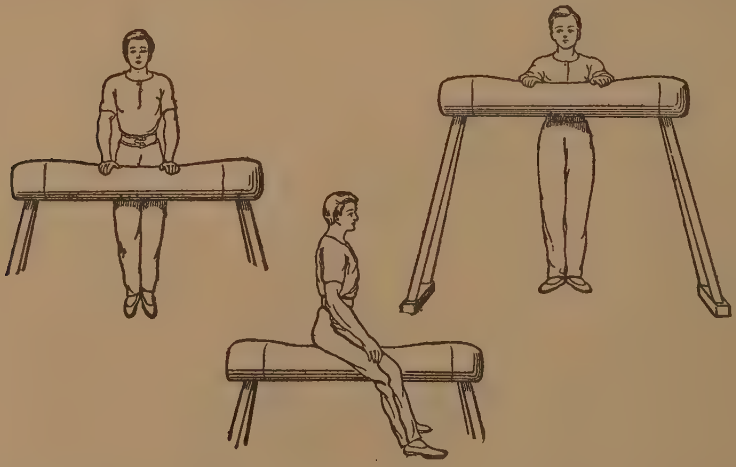
The Vaulting Bar.—This bar, particularly valuable in promoting the development of the lower limbs, is a smooth, straight, round piece of ash, two and a quarter inches in diameter, except at the ends, where tenons are formed to run up and down the grooves in the standards. The standards ought to be seven feet high, pierced with holes three inches apart, fitted with iron pins for the bar to rest upon. Thus the bar can be raised or lowered to suit the size and capacity of the pupil. In the first exercise, as shown in the cut, let the hands grasp the bar; lift the feet from the ground, pressing strongly with the hands, rising to the full extension of the arms and inclining the body slightly forward during the ascent. Hold the head erect, the spinal column upright, the legs straight, the feet close together. After assuming this posture, raise the left leg, as seen in the figure, till at a right angle with the other limb, and place the foot upon the bar. To assume the third position seen, raise the right leg and bring the foot up to the left, clear the bar, the whole column of the body and the lower limbs passing over it in a horizontal line.





Vaulting by Back Lift.—In this the bar is grasped as before described, and then putting forth a vigorous effort with both hands and feet, simultaneously throw the body over the bar in a straight line vertically above the head, the arms bending during its ascent, the elbows held close by the sides, the head and shoulders inclined to the front, the column of the body and the lower limbs, with the toes pointing upward, making a vertical line when above the bar, as seen in the adjoining figure.

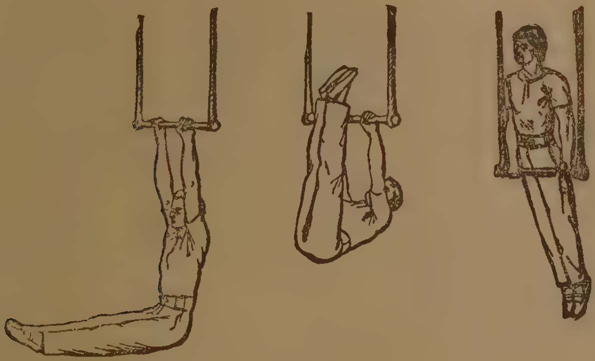
The Vaulting Horse.—This is a higher order of machine than the bar. It plays an important part in the cavalry drill of soldiers. The body of the vaulting horse should be perfectly smooth, the top and sides covered with leather, the upper portion stuffed with hair. The pommels should be movable, and the legs provided with slides, so that the horse can be set firmly at any height between three and six feet. The exercise consists of three parts. In the first posture the body is erect, with the hands resting on the horse; in the second the body is raised by the strength of the arms; in the third the



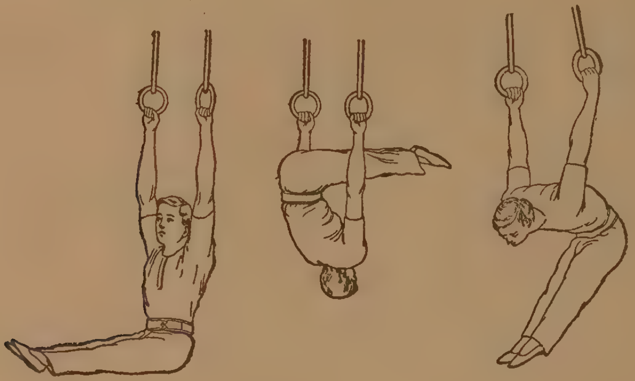
right leg has been thrown over the horse, the mount made, and the body thrown into proper position.

Parallel Bars.—Parallel bars are simply constructed and give a rise to a variety of movements, bringing into play chiefly the muscles of the trunk and arms. These movements may be divided into three series. The first consists of traveling along the bars with the hands, backward and forward. The second comprises movements of oscillation between the bars. The third is made by combinations of the other two.

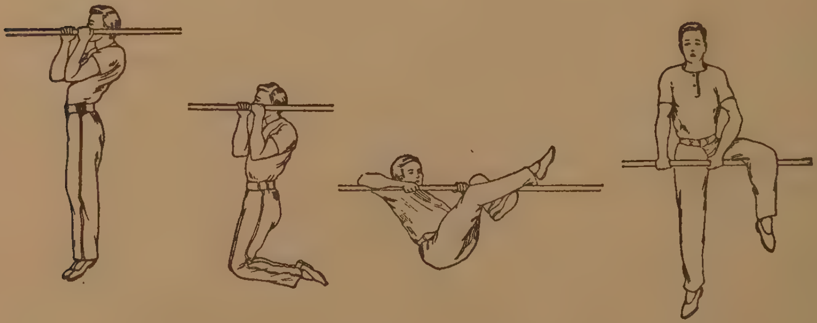
The Trapese.—This simple gymnastic apparatus affords an immense variety of healthful exercises, increasing the capacity of the trunk and upper limbs. The adjoining figures show three favorite positions: First, grasp the bar firmly with the hands, at a distance apart sufficiently to let the body pass between them, the backs of the hands upward, and the fingers and thumb meeting; bend the legs forward, at the same time lowering the body until the arms are fully extended; second, lift the feet upward, the arms remaining straight, until the feet are as high as the bar; bend the arms and elevate the body until the waist is on a level with the bar; pass the lower limbs over bar, the body following; third, lower the body, completing the circle, and slowly descend until the feet reach the ground.



The Rings.—Combined rings give a varied course of movements, similar to those brought about on the trapese. The rings should be each five inches in diameter, and suspended some five or six feet from the floor, and about eighteen inches apart. The cut shows three favorite movements: First, the pupil, standing between the rings, grasps one in each hand, lowers his body till the arms are fully extended, extends his feet, and holds his legs in a horizontal position. Second, he then throws both feet upward, turning a somersault between the rings, the arms and legs being held straight throughout. Third, a slow descent is then made to the ground, completing the circle and relinguishing the grasp.

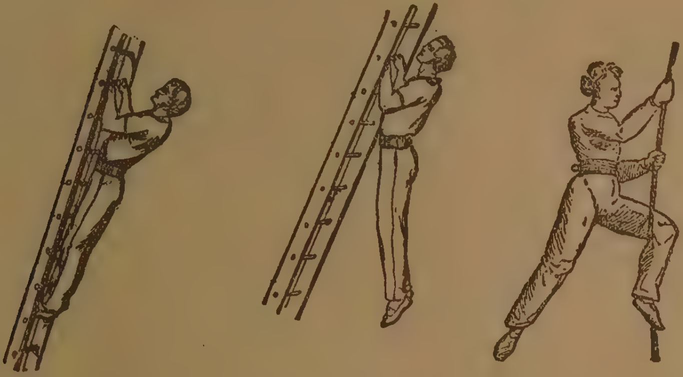


The Horizontal Bar.—The exercises upon this gymnastic appliance are very valuable for the distinct reasons: First, on account of their own intrinsic merit, and, second, from the circumstance that they are capable of being executed by an entire class at the same time, all obeying the same word of command. Favorite movements are shown in the cut: First, the travel along the bar with the arms bent, the right hand leading; second, passage along the bar with the legs bent at the knees; third, springing from the ground and grasping the bar on its right and



left sides with both hands, passing the left leg over the bar, and the right leg over the left; fourth, raising the body above the bar, and assuming a position with hands and left leg supporting the body on the bar.

The Inclined Ladder.—This useful gymnastic appliance not only improves muscles but begets a courage which may become useful in case of fire. As seen in the figure, one of the exercises is ascending with the right hand leading, and descending with the right foot leading. A second is ascending by means of the hands only. The illustration also shows a valuable exercise upon the rope, by ascending and descending.



PART III.

CALISTHENICS.

Nature.—Under the title, calisthenics, or graceful movements, are classed those light exercises, having in view the same object as heavier gymnastics.

Convenience.—Calisthenics may be carried on without the use of machines, or with the aid of such movable appliances as are easily obtained and readily transported. In some respects calisthenics are at a disadvantage when compared with machine gymnastics; in other respects they possess advantages.

Suitability.—They are better suited to children than heavier gymnastics, also to delicate adults, especially females, and can be practiced in large classes under the direction of an instructor, or alone and in private. They can also be practiced on an open porch, near an open window, or out in the air, in such a way as to secure the greatest amount of vitalizing oxygen. Again there is economy in calisthenics, for there is no expensive apparatus, the only need being a few inexpensive appliances.

THE DUMB-BELLS.

Variety.—Of the simpler forms of apparatus, dumb-bells are among the more ancient and popular. There are many varieties of dumb-bells—heavy, light and middling. They also differ as to substance—iron, wood, etc. The value of each variety depends on the mode in which it is used.

Preferable Varieties.—For the elaborate and complicated movements designed for bringing all the muscles into play, light wooden dumb-bells are preferable. On the other hand, when dumb-bells are employed in energetic exertion and in a brief space of time the heavier kind are preferable.

Rule for Beginners.—A good rule is to begin with dumb-bells, each one equal to one-fifteenth of the weight of the body for males, and one-twentieth for females. After a few weeks, if implements of this size are not found to call forth a sufficient amount of muscular energy, they should be substituted for heavier ones. It is advised to increase the weight of the dumb-bells about fifty per cent. every time a change is made. The best way of all is to make such alterations of the resistance to be overcome only under the direction of a medical man or an instructor in physical education.

Advantages of Dumb-Bell Exercise.—McLaren thus sums up the advantages of exercise with dumb-bells:

1. The dumb-bell is familiar to everyone, and has been in use from time immemorial. Its weight and substance are easily recognized, and the exercise it affords is real and effective.

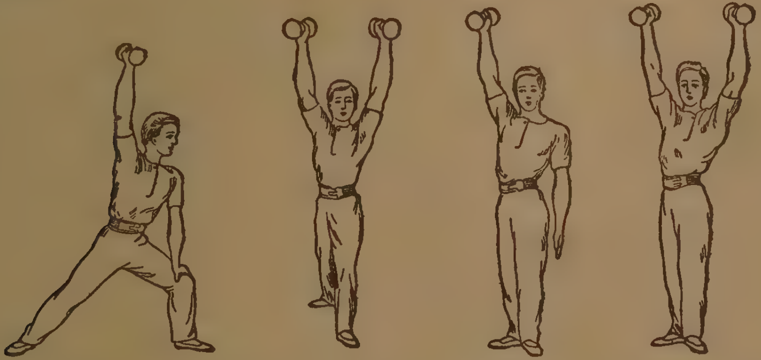
2. It admits of being exactly proportioned to the individual strength of each learner.

3. It can be adjusted to the advancing capacity of the learner, the weight of the bar and bell being augmented as the strength increases.

4. Its exercises give fair employment to all parts of the body and to both sides equally.

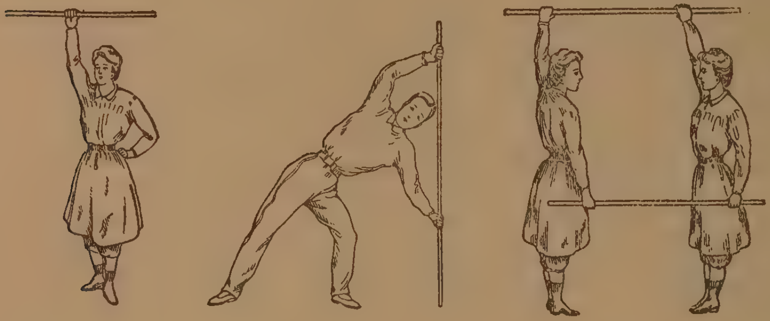
5. They are capable of being executed by an entire class.

6. The positions and movements are of the highest value as exercises, and directly and powerfully conduce to erectness of carriage and freedom of limb.

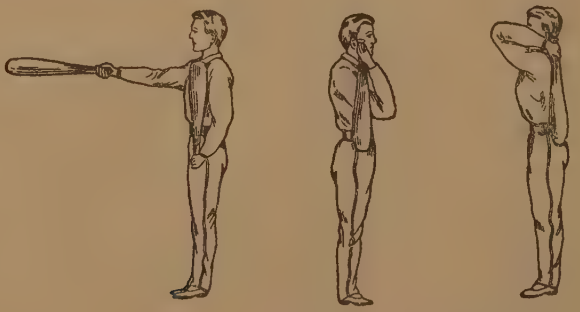


Among the many varieties of dumb-bell movements, the illustration shows, first, the posture of body to be assumed when the right-hand movements are about to be practiced; second, the posture when the bells are used, one in each hand, to be raised and lowered straight down by the sides; third, the posture when a single bell is to be manipulated first with the right and then with the left hand; fourth, the posture when the bells, one in each hand, are raised and lowered, with alternate steps forward with right and left foot.

Wands and Sticks.—In French gymnastics, exercises with simple wands and sticks are in great favor, as imparting grace of carriage and movement in the upper part of the body. The shoulder joints are especially improved in suppleness, and their spheres of movement rapidly enlarged. As in the cut the wand or baton may be firmly grasped in the right hand, the other being placed on the hip. Elevate the wand to the full reach of the arm, and strive to keep it in a true horizontal position. Next, grasp the baton in the left hand, bring it to a vertical position, with one end on the ground, bend the body and limbs without inclining the rod from its perpendicular. Pupils exercising in couples may combine their rods and pass through a series of pleasing and healthful arm movements, as seen in the cut.



Indian Clubs.—A vast number of complex movements may be performed with these appliances.



The illustration shows the postures when the clubs, one held in each hand, are to be extended straight forward the full length of the arm, alternately. Next, swing the clubs upward and then backward, letting them fall into position behind the upper part of the arm. A third exercise is to restore the clubs to the first position, circle them upward as high as the arms will allow, then carry them down over the back. The head should be kept well back and the chest expanded.

Swedish Movement Cure.—First, the arms are moved slowly upward and outward, till they attain a vertical position above the head. While raising them the arms are gently rotated, so that the palms of the hands shall face each other and the fingers be extended when the highest point is reached. Head and chest are to be held erect. The effect is to cause a stretching of the back and neck, a pulling back of the shoulders and a bringing of the muscles of spine and neck into action.

Standing Arm-Circling.—This is a second exercise of the Swedish movement cure. The stretched arms are slowly moved straight forward, upward and sideways, then down again in such a manner as to describe a circle of which the shoulder joint is the centre.

A Third Swedish Movement.—This is designed to overcome the tendency to stoop-shoulders. The position of the arms at first is with the clenched hands just in front of and almost in contact with the shoulders, which should be well drawn back. From this posture the arms are to be suddenly thrust upward to their full reach, and then slowly returned to the primary position. The process should be repeated from eight to sixteen times daily, and its beneficial effects upon the vigor and beauty of development are often speedily apparent.

Wing-Standing.—Another exercise of the Swedish movement is that known as wing-standing. It is for invigorating the flat muscles on chest and back. The hands are placed on the hips, the thumbs forward and fingers backward, elbows a-kimbo. From this posture the elbows are moved slowly backward as far as possible, then allowed to resume their original position. The movement should be repeated eight or ten times.

Further Swedish Movement Cures.—Standing, arm bending and stretching movements are particularly relied upon to increase suppleness of joints and impart strength to muscles.

For Rheumatism.—They are recommended as a specific remedy against weakness and rheumatic pains in the joints concerned in performing these movements. To individuals whose breathing powers are feeble, as is so apt to be the case with those who lead a sedentary life, these exercises are exceedingly valuable, not only on account of their invigorating the organs of respiration, but also in consequence of their stimulating effect upon the digestive functions, so useful in all cases of nervous and general debility, and of impoverishment of the blood.

For Catarrhs.—In cases of chronic catarrh or bronchitis these exercises are also useful for relieving the engorged lungs of blood, which is forced out of the thorax into the active muscles of the arms. Persons with weak chests must, however, employ them with due precaution, and in patients with severe disease of the heart or lungs they should not be resorted to without the special advice of a physician. In order to render the exercise more arduous, and its effects therefore in suitable cases more actively beneficial, the exercise may be modified by flexing and extending the arms in these directions alternately instead of together. Under such circumstances, the respective positions of the arms should be exchanged several times during the performance.

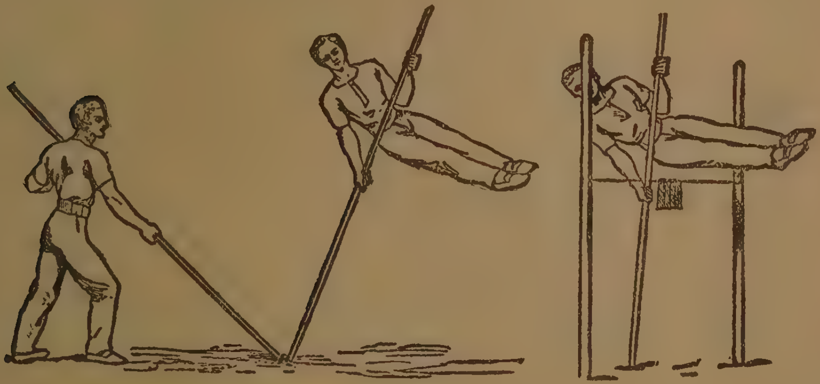
For Thoracic Troubles.—A simple but useful movement, valuable for strengthening the shoulder-joints and muscles of the arms, as well as for relieving the thoracic organs when engorged with blood, is that called cross-standing arm-rotation, inward and outward. During this exercise the arms, previously stretched out at right angles to the body, are rotated round their long axes inward in pronation, and outward in supination. This rotary movement is executed partly in the shoulder-joint, and partly by the radius being rotated around the ulna, carrying, of course, the hand with it.

Walking.—Among the most evident effects of a brisk walk we notice that generally the color comes into the cheeks, the temperature of the body is raised, the breathing is quickened, the pulse beats more frequently, and the skin grows moist. Subsequently, as a rule, the appetite is increased, and the digestion improved. Most of the important muscles of the frame, except those of the arms, are more or less brought into play whilst walking. The body must be held erect by the muscles of the trunk, and, of course, those of the lower extremities are in full activity.

Leaping.—To leap height, take a position a short distance from the barrier, bring the arms upward and forward to their full reach above the head, the hands being closed, and swing them downward again their full extension, at the same time bending the knees until they project over and beyond the toes, raising the heels, and bringing the weight of the body on the forepart of the feet. Repeat this movement three times, and after the third depression of the body spring from the feet and clear the barrier.

Leaping Width.—To leap width, take a posture of attention, with the toes at the edge of the transverse mark. Next bring the arms slowly upward and forward to the line of the shoulder, the fists being firmly clinched. Swing them again downward and backward to their full extension, at the same time flexing the lower limbs, and repeat these movements three times. Then spring from the feet, with the entire force of propulsion of the lower limbs, and at the same instant throw the arms to the front, as seen in the illustration. Lastly descend lightly, but let the entire soles of both feet meet the ground at the same time.

The Leaping Pole.—To leap width take a position one pace from the mark, with the pole held horizontally across the body, the arms bent, the butt of the pole directed slanting toward the front. The hands should grasp the pole about a foot apart, the right one in front, the palms being upward, the fingers and thumbs meeting, or with the palm of the right hand downward. Next step forward with the right foot to the edge of the mark, advance the butt of the pole to its utmost reach, and fix it in the ground without displacing the feet, or changing the grasp of the hands. Then spring from the feet and pass by the left of the pole, the whole body and lower limbs being held straight and extended in one line when crossing it. Descend gently, and as the feet meet the ground raise the pole to the horizontal position in which it was held at the beginning of the evolution.



PART IV.

RECREATIVE EXERCISES, SPORTS AND PASTIMES.

A Characteristic.—Unlike gymnastics and calisthenics, which have the quality of being lessons, the characteristic of recreative exercise is that it is not a task but a pleasure to be rewarded for duty diligently done, and intellectual or corporeal labor faithfully performed.

Gratification.—This pleasure or gratification was an important influence in aiding the physical effects of exercise, and so powerful do we find it as a promoter of health that many pastimes, in themselves less beneficial than gymnastics, are thus rendered far more advantageous in their effects upon the well-being of the human organism.

Value of Freedom.—A great part of the benefits derived from sports of different kinds is doubtless due to the freedom from all restraint with which they are practiced, and this fact prevents the laying down of strict hygienic rules for their indulgence. As the play of a kitten or colt owes a portion of its beauty, pleasure and utility to its spontaneous, free character, so our best pastimes depend for their chief charm upon the fascination of freedom.

Some Regulation Needed.—Still, in order to get the most fun out of games, there must be some regulations, and there are few sports in which certain slight modifications are not more beneficial to health, and less open to objection from a sanitary point of view. To point out these favorable conditions and indicate some of the evils to be avoided is our purpose.

ROWING.

Place of Rowing.—Among summer pastimes rowing holds a conspicuous place. The pleasant sensation of rapid movement, without exhaustive effort, has for nearly all of us a peculiar fascination.

Holme's Ideal Boat.—Our boat is something of the shape of a pickerel as you look down upon his back, he lying in the sunshine just where the sharp edge of the water cuts in among the lily-pads. It is a kind of giant *pod*, as one may say—tight everywhere except in a little place at the middle where you sit. Its length is from seven to ten yards, and as it is only from sixteen to thirty inches wide in its broadest part, you understand why you want those "outriggers," or projecting iron frames, with the rowlocks in which the oars play. My rowlocks are five feet apart—double the greatest width of the boat.

Modern Racing Boats.—All modern racing boats, and most pleasure boats, are built with outriggers. This construction gives much more power to the oars. The rower sits nearly in the middle of the boat. He bends his knees, which are placed about an inch apart, places his feet, with heels close together, against the stretcher, exactly in front of the body. Thus he sits square to his work, and is sure to swing backward and forward exactly in line with the boat's keel.

Action of Rowing.—Rowing action is made up of two chief movements, the stroke and feather. The stroke is made by pulling the oar supported in rowlock through the water with the blade at right angles to the fluid traversed, so as to secure the greatest amount of resistance. In feathering, the oar is revolved upon its own axis at the conclusion of the stroke by turning the wrists, and thereby bringing the blade into a plane parallel with that of the surface of the water. The term is also often made to include the whole process of carrying back the oar in that same position, and commencing another stroke, as the oar is then technically spoken of as on the feather. This great accomplishment of rowers can be best acquired by the learner carefully watching and imitating masters of the art, as descriptions, however elaborate, are of little use.

Principles of Rowing.—The three main principles upon which success in rowing depends are, first, the keeping of perfect time; second, the putting in of the oar exactly at right angles to the surface of the water; and thirdly, rowing the stroke right out with the legs brought well into use. With reference to time a beginner is advised never to remove his eyes from the shoulders of the man in front of him, following his every motion, and making sure that if the time is wrong he will at all events not be to blame. He should be careful not to hurry the body forward, under the impression that he may otherwise be late, for this only makes the boat roll, and nothing demoralizes a crew more than that. Quick recovery after a stroke, and the free use of the legs, the moment the oar gets into the water, are important agents in the acquisition of that inspiriting "lift" which is so desirable in boat-racing.

Swimming.—Every wise man will learn to swim before he trusts himself to any kind of a vessel upon deep water. In fact so many accidents are continually occurring upon the water that the art of swimming should be learned by both sexes in early life. Swimming exercises are both invigorating and hardening, and of great value in the preservation of health, if used in moderation, but they call forth such extensive muscular action and throw such a strain on other organs besides the muscles, that their effects, joined to those of the cold water, tax the utmost forces of many persons, even if indulged for ten to fifteen minutes.

Learning to Swim.—A favorite method of acquiring swimming postures and motions is to place the learner upon a low folding stool, his belly resting on the flexible canvas of the stool. The arms are bent at the elbows, the open hands brought in contact with each other just beneath the chin, and the legs somewhat bent, so as to approximate the heels to the lower part of the back. At the word "one," which the pupil should count after the instructor, the arms and the lower limbs should be quickly and forcibly stretched out, the hands held close together, with the palms in a horizontal plane, facing downward, and the feet separated some fifteen or eighteen inches. At the word "two," the knees are to be approximated, the legs still held extended, and the hands separated about six inches, the palms being directed more outward, though still somewhat downward. Lastly, at the word "three," describe with each hand a quadrant of a circle, striking somewhat downward, and still more backward. At the same time the heels are to be drawn up, and at the conclusion of the effort to strike out, the hands are to be restored to the first position, shooting them straight forward again in the line of the supposed swimmer's movement in the water, in order to interfere as little as possible with the onward progress through that fluid.

Learning Real Swimming.—The first essay at real swimming may be facilitated by the use of the swimming-belt, or by securing the aid of a friend to support the learner under the body, or by two fingers under the chin. Most people, however, who have practiced enough to gain familiarity with the required movements as above directed, will be able to acquire the art without help. At first the attempt should be made in rather shallow water, and a still inlet or little bay of the sea has a great advantage, in that salt water buoys up the body much more than fresh. A good preparatory exercise is to rest the hands on the bottom, where it is just far enough below the surface to allow the shoulders to remain uncovered, and then perform the leg movements as already described. After a little confidence is thus gained, let the learner wade out a short distance further until the waist is covered, and then stooping forward quietly perform the combined arm and leg motions as before directed, keeping the body at the right inclination, and bending the head well backward, exactly as shown in the accompanying illustration. At the first few trials, some friend who is quite at home in the water should be close by to stretch forth a helping hand and support the pupil the moment such aid becomes necessary.

Cramps.—When cramps occur during swimming the best plan is to turn on the back or tread water, keeping oneself afloat by paddling with one hand, while the other is used to press or rub the affected parts. Two swimmers treading water can effectually aid an exhausted or drowning person by supporting him, one under each arm, and carrying him along with his head above water and the body and limbs stretched out motionless.

Skating.—This accomplishment can be best learned by one when young. In learning the most important points to be acquired are to turn out the toes, to keep the centre of gravity always in front of and on the inner side of the feet, to allow each foot to complete its stride before the next one is commenced, and above all to keep the ankles stiff and firm.

Laws of Gravity.—The whole art of skating depends upon a practical knowledge of the laws of gravity or what is commonly called the balance. Just as a boy's hoop will roll along firmly erect whilst in rapid rotation, yet begin to vibrate from right to left, and, finally losing its balance, fall sideways as its motion grows slower, so will the balance of a skater on the thin edge of his skate be perfectly secure whilst he skims quickly along, but tottering or entirely lost if he neglects to keep up the rapidity of his movement. Yet difficult as it seems at first, courage, confidence in the possibility of succeeding, fortitude in bearing hard knocks, and resolution not to be beaten will in a very few hours accomplish wonders in the way of learning to skate. If the novice will strive earnestly to keep his head up and his hands down, turn his toes well out and make long, clear, firm strokes with each of his feet, he will soon master the perplexing mysteries of the inside edge, and after that has been overcome will find, like the juvenile geometer who has safely crossed the *pons asinorum*, that his greatest obstacle has been surmounted.

Roller Skating.—Although this variety of skating exercise, which has recently become so wonderfully popular, does not involve any peril of drowning, it is by no means free from danger to health or even to life. Besides the increased chance of bruises and broken bones from collisions in crowded rinks, the great risk to life is from pneumonia and other pulmonary affections, as a result of taking cold from exposure to draughts of air whilst the skin is moist with perspiration. The pleasurable excitement of skating, especially in agreeable society, is so great that few persons realize what vigorous muscular exertion they are making until after they sit down to rest, and, as already explained, such energetic contraction of the muscles, with its consequent increased production of heat, results in a profuse flow of perspiration, bathing the surface of the body and rendering its partial cooling by a current of air extremely dangerous. This evil is aggravated by the fashion, only too prevalent, of keeping on hats, bonnets and outer wraps, instead of changing the ordinary garments for lighter and looser clothing, as is or ought to be customary in all well-managed gymnasiums. Great care should be taken therefore to provide such external coverings as can be readily laid aside during active movement, and promptly reassumed on the cessation of vigorous muscular exertion. It is also advisable that persons who are heated and perspiring should not, although well protected by warm clothing, pass abruptly out into cold, and particularly, cold night-air, which being inhaled over the heated mucous membrane is especially apt to set up the inflammatory action of bronchitis, pneumonia and consumption.

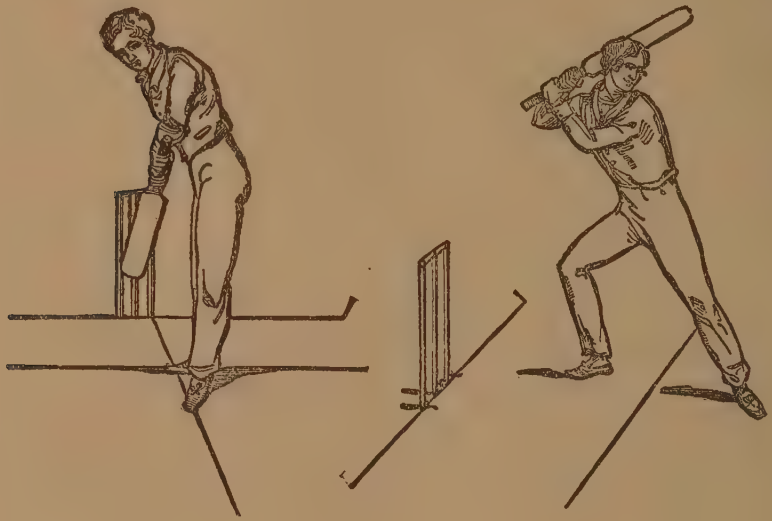
Dancing.—The influence of ordinary dancing upon health would no doubt be beneficial were it not for the unhygienic surroundings which usually environ it. The amount of exercise obtained during a long waltz, provided it is not too long, no doubt does a great service to many a fashionable woman. Such an individual is often a stranger to proper walking exercise, and therefore a good dance, which compels her to breathe more deeply, assists the action of the liver and causes the blood to circulate more freely through the heart and great vessels, may be just what she needs to promote her health. Were it not for the length of time the revolving movement is kept up in a prolonged waltz, affecting the nervous system injuriously, and on account of the insanitary environment at most dancing parties and balls, they would be excellent means of inducing the lazy and careless to take exercise enough to meet the hygienic requirements of their frames.

Riding.—Riding exercise can be taken by almost every one with advantage throughout the whole period from childhood to old age. In youth the great benefit proceeds not only from the exercise, but also from the tendency which it has to the formation of a bold and fearless character, whilst at the same time it teaches a love and regard for the most noble of the lower animals. There is something wonderfully inspiriting in rapid movement on the back of a galloping steed, and more than one great man has declared that his most brilliant ideas, as well as his most profound thoughts, have come to him whilst on horseback. For delicate females, and for men who are suffering from the effects of sedentary life, high living and other causes which produce congestion of the abdominal viscera horseback riding sometimes proves invaluable, and there is no doubt that cure in some cases of incipient consumption has been largely due to a judicious employment of this form of exercise.

Bicycling.—Beside its practical qualities as a vehicle, the bicycle affords one of the best methods of taking enjoyable exercise. It brings into use a large number of muscles of both body and limbs and tends to a harmonious development of both sides of the human frame. At the same time it increases the lung power and the action of the heart. Persons in delicate health, and especially those subject to heart disease, should be careful to avoid too long or rapid riding. After this caution there are comparatively few constitutional or acquired physical weaknesses which may not be benefited by the admirable combination of muscular action and out-door life which the bicycle affords.

Out-Door Games.—The great variety of out-door games which have been devised, possess the advantage of leading to active exercise in the open air and are all therefore highly conducive to health. According to the different natural ability, acquirement or taste of an individual will be the personal predilection for one or more of these pastimes, and, as a general rule, the one in which a man finds the most intense and satisfying pleasure will be the one which proves most permanently beneficial to him. This is true for the reason already pointed out, that happiness is the best tonic and the most powerful stimulus which can be applied to the majority of mankind.

Cricket.—Perhaps of all the out-door games that of cricket, shown in the adjoining cut, offers not only the most healthful recreation to players, but presents to those who understand the game one of the most agreeable means of passing their leisure hours in the open air. It cannot be denied that the members of a cricket club who in strength of arm, quickness of eye and presence of mind are so superior to their fellows as to render them most expert batsmen, are precisely the ones who have the largest share of the exercise which they least need for perfect development, and yet this disadvantage for those who are caught out on the first or second ball can in great measure be remedied by care in equalizing the players on each side. Thus not only may a greater amount of pleasure for all concerned be derived, but also the advantageous results to health obtainable from this noble pastime are conferred with greater fairness upon each of the participants.



Book VIII.

HOMEOPATHIC MEDICAL SCIENCE AND HEALING BY SPECIAL SCHOOLS AND METHODS.

PART I.

"The greatest triumph of a science is when it becomes the common property of the people and thus contributes to the common weal."

HOMEOPATHY.

Object.—This Part I of Book VIII is intended to be a guide, by the aid of which, in many cases of disease, a cure may be effected with homeopathic remedies. Those whom experience has convinced of the advantages of the system of Hahnemann will soon learn how to make use of it. To those who have had no opportunity of testing the merits of homeopathy it will give a chance of trying it, instead of the so-called domestic remedies.

ADMINISTRATION OF THE MEDICINES AND REPETITION OF DOSES.

Adult Doses.—The medicines may either be administered dry, by placing them on the tongue, or dissolved in water. In most cases four or five globules should be placed dry on the tongue.

Infant Doses.—For infants, one globule will be amply sufficient for a dose. If the tongue is dry add a few drops of water. Even new-born infants are able to swallow that.

Intervals.—Where repeated doses of the medicine at short intervals are required the appropriate remedies should be administered in solution, in water.

Preparing the Glass.—For this purpose take a clean tumbler which has contained nothing but milk or water, else you must rinse it first with cold and afterward with hot water, dry and heat it on a stove as much as the glass will bear, and then suffer it to cool.

Preparing the Medicine.—Fill it half full of water, as pure as you can get, put eight or ten globules—or, if a trituration, as much as will lie on the point of a penknife—of the medicine into the water, and mix it thoroughly by repeatedly pouring it from one tumbler into another, or, if you have only one tumbler, by means of a clean spoon.

Keeping the Medicine.—Keep the tumbler containing the medicine well covered with a saucer or piece of paper, in a cool place, free of odors of any kind.

General Dosage.—When thus prepared, a dessertspoonful to adults, or a teaspoonful to children, may be given at a time. In acute cases the medicine may be repeated every one, two or three hours. But in chronic complaints, or those of long standing, not oftener than once or twice a day.

Observing Effects.—After the first dose of every medicine you should watch closely to observe what changes, if any, take place in the patient. In very dangerous or painful cases wait from ten to thirty minutes; in other serious complaints, one to two hours, and in chronic cases one to two days. The patient is then either better, worse or the same. If better, give nothing more as long as the improvement lasts. If a sudden improvement ceases as suddenly, and the case gets worse, give another dose.

Repeating Doses.—This second dose may in some cases be followed at first by an increase of the complaint, but in a short time by a more decided and lasting improvement.

Change of Dosage.—If a complaint has improved from a remedy given for its cause, but the same has again occasioned the old trouble, give another suitable remedy. For instance, if the bad consequences of a fright have been removed by opium, but a fresh fright has caused the same symptoms, give aconitum.

In Colds.—If you have taken bryonia for the consequences of having taken cold, and have been relieved by it, but a fresh cold makes you worse again, take aconitum.

The Best Medicine.—When the patient, after having taken the medicine once, or oftener, begins to feel better, however little, he should discontinue it, lest the healthful progress of the cure be interfered with by taking too much. But, as soon as the improvement ceases, the same medicine should be taken again; or, in case the symptoms have altered, another more appropriate one.

Following Symptoms.—If the patient is worse after the first or second dose the symptoms are either the same, but worse, or there are new symptoms instead of, or in addition to, the former ones. If the latter case, give *another* remedy. If the former, when the medicine aggravates the symptoms and makes the patient *temporarily* worse, which is, nevertheless, a good sign, the patient should *cease taking it*, and *wait* for the effects. Should the aggravation be violent it may be relieved by smelling camphor or sweet spirits of nitre.

Relieving Pain.—It sometimes happens that the most violent pains are increased very much by the smallest dose of the suitable remedy. In such cases give a spoonful of black coffee, and as soon as the aggravation has ceased, repeat the remedy. If made worse again repeat the coffee, and so on until the improvement is permanent.

In Tedious Cases.—In very tedious cases, when the right remedy has been chosen and given in but one dose, and when the patient, after a short aggravation of the symptoms commences to grow better, he will sometimes, in a few days or a week, get worse again. He who can now wait and give nothing more will witness most remarkable cures, which will be the more permanent and complete the less they have been interfered with.

Counteracting Agents.—If the beneficial effects of the medicine are interrupted, or cease entirely, and the patient grows worse in consequence of taking cold, eating improper food, and so forth, he should take a medicine to counteract the cause which occasioned this interruption, and then again the medicine which he had previously taken. Always give but one remedy, and only when this does no more good should you try another one.

Tinctures and Lotions.—With regard to the external application of the tinctures of arnica, ruta, and so forth, a lotion of sufficient strength for most purposes may be made by putting five or six drops of the tincture in half a tumbler of water. It may be applied to the injured part three or four times a day, or as often as mentioned under each particular case.

LIST OF REMEDIES.

Aconitum.
Antimonium crudum.
Antimonium tartaricum.
Argentum nitricum.
Apis.
Arnica radix.
Arsenicum.
Belladonna.
Bryonia.
Calcarea.
Cantharides.
Capsicum.
Carbo vegetabilis.
Causticum.
Cepa.
Chamomilla.
China.
Cina.

LIST OF REMEDIES—Continued.

Cinchona (see China).
Cocculus.
Coffea.
Colocynthis.
Crocus.
Cuprum metallicum.
Drosera.
Dulcamara.
Euphrasia.
Ferrum.
Ferrum phosphoricum.
Gelsemium.
Glonoine.
Hamamelis.
Hepar sulphuricum.
Hyoscyamus.
Ignatia.
Ipecacuanha.
Lachesis.
Lycopodium.
Mercurius.
Mercurius sublimatus.
Natrum muriaticum.
Nux moschata.
Nux vomica.
Opium.
Petroleum.
Phosphoric acid.
Phosphorus.
Platina.
Pulsatilla.
Rheum.
Rhus toxicodendron.
Ruta.
Sabina.
Sambucus.
Sanguinaria.
Secale.
Sepia.
Silicea.
Spigelia.
Spongia.
Staphisagria.
Stramonium.
Sulphur.
Viola tricolor.
Veratrum album.
Zincum.

FLUIDS FOR EXTERNAL USE.

Arnica (tincture of root).
Calendula.
Cantharides.
Hypericum.
Ruta.

The medicines should be kept in a dry and not too warm place, free from odors, and excluded from a bright light.

DISEASES AND THEIR HOMEOPATHIC TREATMENT.

The diseases are given in their alphabetical order, so that they may be referred to quickly.

The cause or etiology, symptoms and diagnosis of a disease are the same, no matter what the treatment.

Homeopathy differs from the other regular schools of medicine merely in the treatment of the disease.

Consequently, as the cause, symptoms and diagnosis of each disease are given elsewhere in the book, in this chapter we will confine ourselves to the homeopathic treatment.

Abscesses.—An acute abscess should not be poulticed with warm bread and milk or linseed poultices, except in extreme cases. It is much better to use nothing but warm or cold water. Hepar or mercurius hastens the suppuration.

If the suppuration should continue for a considerable length of time use silicea. When hard places remain, mercurius will be useful. For hard and swelled glands on the neck and under the chin and ears use mercurius, dulcamara, calcarea carbonica, and so forth.

Ague.—See Malaria.

Apoplexy.—Bleeding is sometimes practiced. If the pulse is slow and full, face red or pale, give opium; put a few globules of it upon the tongue, and use some globules dissolved in a pint of water as an injection. If the pulse is very weak give lachesis in the same way.

If it was preceded by nausea, or if the patient vomits when he recovers, give antimonium tartaricum; if not better in half an hour, use a solution of the same remedy as an injection.

Asthma.—Ipecacuanha will be indicated where there is a feeling of constriction about the chest.

Arsenicum for the most violent attacks, especially those occurring in consequence of suppressed catarrh, or in persons with weak lungs.

Bryonia or apis are of great benefit, particularly when exercise aggravates the disease, and when it arises from suppressed or tardy eruptions. Bryonia when the paroxysms come on at night and are attended by pain in the bowels. Apis if the neck feels as if it were compressed.

Nux vomica and lachesis are often beneficial when the patient is forced to sit stooping forward.

Belladonna is most suitable when the attacks are made worse by motion.

Arnica is indicated when not only exercise but even speaking or blowing the nose aggravates the symptoms.

Cepa and euphrasia if children awake suddenly in the night with a suffocating cough.

If the chest feels constricted, give glonoine.

Cinchona when there is whistling and wheezing in the chest.

Coffea in very sensitive persons who are liable to attacks of asthma in consequence of mental emotions. Aconite, pulsatilla, nux vomica, ignatia, chamomilla and stapisagria are also given in these cases.

Chamomilla is also serviceable when there is frequent inclination to cough.

Rhus when there is very labored breathing.

Sulphur for short, wheezing, obstructed respiration with fear of suffocation.

Bed Sores.—Applications of cold water are often beneficial.

When water alone will not effect a cure, dissolve in it a few drops of arnica tincture.

If there appears to be danger of mortification, give cinchona and wash the spots with the same medicine dissolved in a little water.

Bladder.—See Inflammation of Bladder, Hemorrhage of Bladder.

Bleeding.—See Hemorrhage.

Boils.—Arnica will lessen the pain and inflammation.

Sulphur in cases where there is a frequent return of boils.

Belladonna if it presents a fiery-red appearance.

Hepar where the suppuration is too slow and scanty.

Mercurius if the suppuration is profuse and the swelling remains.

Lachesis for very painful boils which become bluish and form rapidly.

Bronchitis.—Aconite when the skin is hot and dry and the pulse hard and frequent.

Pulsatilla if there is less heat and more coldness of the hands and feet.

Tartar emetic in all cases when the rattling of phlegm in the chest is remarkable from the first.

Belladonna when there is severe headache, aggravated by coughing and oppression of the chest.

Lachesis if short, hurried respiration and anxiety with dry, fatiguing cough.

Bryonia if cough is dry, with pain in head and chest.

Phosphorus if the respiration continues oppressed.

Bruises.—Apply to injured parts cloths dipped in cold water, and administer arnica internally.

In very severe cases, followed by fever, give aconite.

A lotion of arnica tincture, in the proportion of half a teaspoonful to a tumbler of water, may also be used.

Should suppuration ensue, hepar must be given.

Burns.—Apply heat, wet or dry.

Bicarbonate of soda will remove the pain.

Soap is one of the best remedies.

Lime-water mixed with sweet oil, or equal parts of linseed oil and lime-water, also make good applications.

Carbuncle.—Arnica given at the very first may lessen the pain. If so, nux vomica will remove the remaining symptoms.

Arsenicum as soon as it is spreading.

Hepar if the patient is weakened by the copious discharge.

Silicia for pain and moderate burning.

Lachesis if bluish spots or blue blisters appear.

Catarrh in the Head.—Camphora tincture, in drop doses every half hour for a few hours, may abort the cold.

Mercurius is the principal remedy in influenza.

Hepar if the symptoms have been better and become worse again. If ineffective, give belladonna.

Cepa for ordinary catarrh.

Lachesis in catarrhs of the severest kind.

Arsenicum when the nose feels stopped up and yet runs.

Nux vomica when the above shows no improvement in twelve hours.

Catarrh of the Stomach.—Ipecacuanha should be given first, and then, if necessary, one of the following remedies:

Rheum if there is diarrhœa of a thin, slimy character.

Veratrum when the symptoms are violent and accompanied by vomiting of bile, and so forth.

Capsicum if accompanied by burning in the throat.

Chicken-Pox.—This disease rarely requires medical assistance.

When, however, there is a considerable degree of fever, aconitum may be given.

When there is much headache, belladonna.

Chills and Fever.—See Malaria.

Cholera Infantum.—Antimonium crudum where the tongue is coated white or yellow; dryness of mouth with thirst; nausea with vomiting; offensive slimy stools, and so forth.

Arsenicum if the child is very weak, pale and emaciated.

Bryonia where the diarrhœa comes on in hot weather.

Ipecacuanha, if given in the commencement of the disease, will often arrest its progress at once.

Cholera Morbus.—Ipecacuanha if the attacks of vomiting predominate.

Nux vomica when there is anxiety, pain in the abdomen, tenesmus, and so forth.

Veratrum should the disease grow worse with cramps, weakness, shriveling, cold, clammy perspiration, and so forth.

Cold.—See Catarrh.

Colic.—Chamomilla is suitable for children, also for grown persons when blue circles appear around the eyes.

Nux vomica when there is constipation.

Mercurius for violent, twisting colic.

Pulsatilla when there is stinging pain in the bowels.

Colocynthis is the principal remedy for colic. It is to be given when the pains are very violent, constant, or only cease for a short time and then recommence with greater violence.

Cinchona for flatulency.

Constipation.—Nux vomica in persons of sedentary habit.

Bryonia in warm weather.

Lachesis when there is a feeling of weight and oppression.

Natrum muriaticum in tedious cases.

Consumption.—Treat in the beginning according to the symptoms that arise. (See Cough and Hemorrhage from the Lungs.)

Cough.—When catarrh is accompanied by cough, or when a dry cough remains after the first symptoms have disappeared under the action of other medicines, give nux vomica.

If the cough is dry and excites retching or vomiting, ipecacuanha.

If it is hollow and causes vomiting, carbo vegetabilis.

If accompanied by tough expectoration, chamomilla.

If it is moist or loose, ferrum phosph. or pulsatilla.

Croup.—If children waken suddenly at night and begin with a choking cough, give antimonium tartaricum.

Where there is great agitation, give aconite every ten, twenty or thirty minutes, according to the urgency of the case.

Spongia is indicated if the voice is rough and the cough hollow.

Hepar if the voice is only lisping and the cough crowing.

Phosphorus and carbo vegetabilis have saved life when all else has failed.

Diarrhœa.—Ipecacuanha in children with screaming, tossing and uneasiness.

Chamomilla for children when they want to be carried constantly.

Pulsatilla for watery and offensive diarrhœa with burning pain and soreness of the anus.

Sulphur for green, slimy diarrhœa.

Antimonium crudum for watery diarrhœa with disordered stomach.

Rheum for sour, thin, fermented diarrhœa, common with children.

Cinchona in all kinds of diarrhœa occurring in debilitated persons.

Diphtheria.—Bryonia when patient is quickly prostrated and complains of pain everywhere.

Belladonna when patient is restless and complains of sore throat.

Lachesis when, after belladonna, by next evening there is no marked change for the better.

Dropsy.—Dropsy may be due to disease of the heart, lungs, liver, kidneys or peritoneum. The treatment of the various forms is given under the different diseases causing it.

Dysentery.—Mercurius when there is an urgent desire to evacuate.

Nux vomica if much straining before and during stool, but relief afterward.

Mercurius sublimatus when first much bile is discharged, and then blood or slime.

Cinchona for epidemic and periodic dysentery.

Veratrum if the discharge is watery, with bloody mucus and flakes swimming in it.

Colocynthis for extreme pain in the bowels.

Sulphur in all protracted cases.

Dyspepsia.—Nux vomica if caused by dissipation and late hours.

Chamomilla when there is a bitter taste in the mouth, bitter eructations, vomiting of mucus or bile.

Antimonium crudum when the patient feels sick at the stomach and the tongue is coated or blistered.

Bryonia when the stomach is disordered and the patient feels cold and chilly.

Ipecacuanha when there is a catarrhal state of the stomach.

Tardy Menstruation.—Pulsatilla especially for females of a mild, easy disposition.

Cocculus when the patient suffers from nervous symptoms.

Belladonna if there is a rush of blood to the head.

Apis if flow is irregular.

Nux moschata for women with an irregular, scanty, black flow.

Phosphorus for women of a delicate constitution.

Arsenicum in cases with great weakness.

Suppression of the Menses.—Aconitum when it arises from fright.

Bryonia for unmarried women.

Too Copious Menstruation.—Ipecacuanha for too great a flow.

Crocus particularly when the discharge is dark colored.

Platina when attended with bearing down pains.

Chamomilla with thirst, coldness of the extremities and sometimes fainting.

Nux vomica when the menstruation continues too long or returns again.

Painful Menstruation.—Belladonna when there is severe pain in the back, with a rush of blood to the head.

Chamomilla when the pains resemble labor pains.

Coffea for nervous excitement.

Erysipelas.—Aconite in cases with much fever.

Belladonna with acute shooting pains, heat and tingling.

Rhus if small or large blisters appear.

Bryonia when the disease attacks the joints.

Arsenicum and sulphur in cases terminating in ulceration.

Fainting.—If it arises from fright, coffea, opium or aconitum.

From loss of blood, a few drops of wine and afterward cinchona.

When produced by sudden emotions, ignatia or chamomilla.

If preceded by nausea, ipecacuanha.

Gout.—Nux vomica for first attack.

Aconitum for violent fever.

Arnica when the pain in the joints resembles that of a spasm.

Pulsatilla when the pain flies quickly from one joint to another.

Calcarea when the attacks return at every change in the weather.

Colocynthis if limbs remain stiff afterward.

Headache.—Glonoine when the attack comes on suddenly.

Aconite when the pain is very severe and over the whole head.

Belladonna when the pain is deep seated.

Pulsatilla when the pain is dull and oppressive.

Rhus when there is burning, throbbing pain.

Heart-Burn.—Nux vomica often helps.

Cinchona if it comes especially after eating.

Carbo vegetabilis if cinchona does not help.

Capsicum if none of the above give relief.

Hives.—See Rash.

Inflammation of Bladder.—Aconite for the most common causes when there is painful urging.

Pulsatilla if there are pressing, cutting pains.

Belladonna if pains are piercing.

Colocynthis if the urine becomes sticky and gelatinous.

Inflammation of the Bowels.—Aconite at the commencement.

Ipecacuanha when the pains are worse in front.

Bryonia when the pain and fever are very violent.

Chamomilla, if the pains are dull.

Jaundice.—Opium, mercurius, cinchona, hepar, sulphur, lachesis and chamomilla have all been used with good results.

Leucorrhea.—Calcarea carbonica when the discharge is milky and often attended by itching.

Pulsatilla when the discharge is thick like cream.

Cocculus if the discharge is mixed with blood.

Natrum muriaticum when the discharge is copious.

Sulphur for inveterate cases when the discharge is yellowish.

Lumbago.—Aconitum if accompanied by much fever.

Bryonia when the patient walks in a stooping posture.

Nux vomica when the affected part feels as if bruised.

Malaria.—Cinchona as soon as you feel unwell.

Ipecacuanha if no better after twelve hours.

Arsenicum when the different stages are not distinctly marked.

Arnica when the cold stage comes on early in the morning.

Veratrum when there is external coldness with internal heat.

Sambucus when the sweating is very profuse.

Belladonna and hyoscyamus when two or more attacks occur in the twenty-four hours.

Measles.—Aconite, the chief medicine, is especially indicated when the fever is violent.

Pulsatilla and euphrasia when the catarrhal symptoms predominate.

Belladonna when the throat becomes sore.

Ipecacuanha for arresting vomiting.

Bryonia when the eruption is imperfectly developed.

Morning Sickness.—Ipecacuanha, nux vomica, arsenicum, pulsatilla, natrum, muriaticum, nux moschata, veratrum and phosphorus have all proved beneficial in the nausea and vomiting of pregnancy.

Mumps.—Mercurius is the principal remedy.

Belladonna or hyoscyamus if the swelling is very red.

Neuralgia.—Aconitum if there is redness and heat of the face.

Belladonna if the pain is most violent under the eye.

Platina for boring, cramp-like pain.

Colocynthis for rending and darting pain.

Arnica for heat and throbbing.

Bryonia for heat and pressing pain.

Nose-Bleed.—Arnica, when caused by a blow, fall, and so forth.

Pulsatilla for women.

Aconite for plethoric individuals.

Carbo vegetabilis, when nose bleeds frequently and from slight causes.

Rhus, when brought on by great exertion.

Palpitation of the Heart.—Aconite, chamomilla, veratrum, coffea and opium when caused by mental emotions.

Nux moschata, when accompanied by fainting.

Cinchona for persons with a sour stomach.

Piles.—Aconite, when blood is discharged.

Nux vomica, when there is a burning, pricking pain.

Apis for small stinging, biting tumors.

Capsicum, when the tumors are much swollen.

Ignatio for violent stitches which penetrate deeply.

Chamomilla, when the blood flows freely.

Pleurisy.—Aconite is the chief remedy.

Bryonia for acute shooting pains in the chest.

Pneumonia.—Aconite in the beginning.

Bryonia for cough with rusty-colored sputum.

Mercurius for profuse sweats.

Antimonium tartaricum, when there is oppression of the chest.

Sulphur for frequent, weak faint spells, and so forth.

Arsenicum, when there is great prostration with anxious restlessness.

Quinsy.—Hepar in the beginning.

Mercurius, when the tongue is furred and flabby.

Lachesis, when there are white or gray patches on the throat.

Rheumatism.—Aconite if there is high fever, dry, hot skin, thirst and redness of the cheeks.

Belladonna, when the pain is chiefly in the joints.

Mercurius and pulsatilla, when the pains are worse at night.

Rhus for red and shining swelling of the joints.

Cinchona for pains which are aggravated by the slightest touch.

Aconite, bryonia, calcarea carbonica, dulcamara, mercurius or sulphur, in chronic rheumatism for pains which are excited or made worse by the slightest chill.

Calcarea carbonica, dulcamara, rhus toxicodendron and hepar sulphuris in chronic rheumatism when the attacks are assisted by bad weather.

Scarlet Fever.—Aconite at the beginning.

Belladonna and mercurius in the simple forms when the eruption is bright red.

Bryonia, when the eruption does not come out well.

Pulsatilla for great restlessness.

Lachesis and lycopodium, when the eruption is dark in color and scanty.

Arsenicum, when the ulcers in the throat turn livid about the edges and emit an offensive odor.

Sleeplessness.—Coffea, opium, aconitum and ignatia when due to exciting events.

Pulsatilla, when due to excess of coffee and tea.

Chamomilla, when due to complaints of the bowels.

Small-Pox.—Aconitum if there are congestions to the head and lungs.

Belladonna if there is delirium with headache.

Bryonia if the eruption is delayed.

Variolinum is the most important remedy.

Sore Nipples.—Tincture of arnica previous to confinement will prevent them.

Arnica internally and bathing the nipples with a solution of ten drops of tincture of arnica to half a tumbler of water several times a day.

Sore Throat.—Aconite for difficulty and pain in swallowing and speaking.

Ignatia, nux vomica and pulsatilla, when there is a constant feeling as if there were a lump in the throat.

Bryonia, rhus and capsicum, when the throat is painful on being touched.

Sulphur for frequent or constant sore throat.

Spasms.—Chamomilla if there is convulsive jerking of the limbs, and so forth, followed by drowsiness.

Belladonna, when the child starts suddenly from sleep with pupils dilated, and so forth.

Ignatia, when the cause is unknown.

Coffea in weak and nervous children.

Ipecacuanha in asthmatic children.

Typhoid Fever.—Baptisia, bryonia, rhus tox., phosphoric acid, arsenicum and hyoscyamus are chiefly used.

Ulcers.—Arsenicum, when they burn greatly.

Carbo vegetabilis, when they smell offensively.

Lachesis, when they spread.

Urinary Difficulties.—Pulsatilla, belladonna, cinchona, silicea or stramonium in inability to retain urine during pregnancy.

Aconite, pulsatilla, arnica, nux vomica, belladonna, mercurius, hepar, colocynthis, apis, cepa and opium for difficulty and pain in making water.

Vertigo.—Aconite, when nausea, eructions and vomiting are present.

Pulsatilla or antimonium crudum, if there be a disordered stomach.

Nux vomica, chamomilla, pulsatilla, rhus or cocculus if it occurs while eating or after a hearty meal.

Whooping-Cough.—Aconite at the commencement.

Dulcamara if brought on by a severe cold.

Pulsatilla for loose cough with vomiting.

Nux vomica, belladonna and hepar, when the cough is dry.

Ipecacuanha, veratrum, carbo vegetabilis, cina, cuprum, metallicum and arnica give good results.

Worms.—Ipecacuanha, carbo vegetabilis, pulsatilla, cinchona and nux vomica are useful remedies.

Aconitum, cina, mercurius, belladonna and lachesis for colic caused by worms.

Sulphur and calcarea for tape worms.

PART II.

HEALING BY SPECIAL SCHOOLS AND METHODS.

HYDROPATHY, WATER-CURE OR HYDROTHERAPY.

History.—The use of water in the treatment of disease was practiced by the most skilled of all the Greek physicians, Hippocrates, 400 years before the time of Christ. Zechariah spoke of Christ as the healing fountain, and, in the thirty-sixth Psalm, David speaks of the fountain of life, showing that water was considered a healing agent even at that time. It was very extensively used by the Romans at the time of their highest development. During the middle ages it fell into disuse, along with many other rational agents. From time to time, however, men of more penetration than their fellows tried to restore it to general use, but usually only succeeded in arousing interest for a short time. Dr. James Currie, well known as the editor of an edition of Burns' poems, who practiced in Liverpool from 1780 to 1805, was the most prominent advocate of hydrotherapy during the eighteenth century. He published a book entitled "Medical Reports on the Effects of Water, Cold and Warm, in the Treatment of Fevers."

Father of Modern Hydropathy.—But it was a German farmer, named Priessnitz, who must be called the founder of modern hydropathy. In the year 1840 nearly sixteen hundred persons visited Graefenberg to be treated by him. His patients came from all parts of the world, and when cured they became missionaries of the new treatment. Schools were started not only in Europe, but in this country also. There is every reason to believe that the water-treatment has now secured a permanent place among the remedies used in combating disease. Professor Wilhelm Winternitz, of Vienna, is to-day the leading advocate of this method of treatment.

Definitions.—Hydropathy is not a good term, since it is derived from two Greek words, which mean respectively, *water* and *to suffer*. It would, therefore, mean strictly water-suffering. The term water-cure is a good one, but may not be considered entirely scientific. Hygienic medicine is another term sometimes used for this method of treatment, but it is not sufficiently distinctive. A far better name, however, is Hydrotherapy, which means *healing by water.* This expresses with entire correctness the end sought by those who practice this form of medication. It is not confined to the use of *cold* water only, as some have supposed. That idea may have arisen from the fact that Priessnitz was a special advocate of cold water.

Hydrotherapy.—*Hydrotherapy includes the application of water, internally and externally, in any form and at any temperature.* It may vary from solid or fluid to vapor; from ice to steam. Mineral waters are not used in hydrotherapy. They are not needed. There is, however, no objection to such waters being used if they are available.

Physiology.—The effects of water upon the body are produced by its heat or cold and the manner in which it is applied. In order to understand this action it is necessary to consider the structure of the skin or outer covering of our bodies. It is an exceedingly complex and sensitive part of us.

The Human Skin.—The skin is very elastic, and this is due to the presence of a network of elastic fibres in its deeper parts. Many very small muscles are also present in the skin. When they all contract at once the appearance known as "goose-flesh" is produced. Great numbers of tiny glands are present, and their openings on the surface are called pores. But more important than any of these are the fine blood-vessels and nerves which are so numerous that it is impossible to pass the finest needle point into the skin without causing pain and bleeding. Through these the application of water can affect the entire system most profoundly.

FUNCTIONS OF THE SKIN.

Nerve Endings.—The fine nerve endings in the skin guard the body like an army of sentinels. They warn us of too great heat or cold, or draughts or threatened injury. Wherever these nerves are the more numerous there the sense of heat and cold is the more acute.

Skin Excretions.—The chief materials given off by the skin are watery vapor and urea, both of which are contained in the sweat; also a gas known as carbon dioxide. Urea, however, is more freely removed from the body by the kidneys. The amounts of these several constituents can be increased or decreased in a wonderful degree by applications to the skin of water at varying temperatures.

Skin a Heat Regulator.—The human body is remarkable in its power to live under conditions so exceedingly variable. It can exist amid the burning heat of the tropics, or surrounded by the icy blasts of Greenland. The skin is one of the main agents in making this possible. So remarkable are its powers that in a hot climate it helps to cool the body, while in cold climates it prevents the waste of heat.

PROPERTIES OF WATER.

Value of Water.—The value of water as an agent in treating bodily ills rests in: First, its power of absorbing and transmitting heat and cold; one pound of water will absorb eight times as much heat as a pound of iron and yet not be any hotter than the iron; second, its flexibility; water can be used in the solid, liquid or gaseous state; its volume increases seventeen hundred times in passing from ice to steam; third, its fluid form enables us to control it so easily and well that we can apply it at pleasure to any portion, or all of the body, as we desire, and for any length of time; fourth, the ease with which pressure can be applied to any part of the body through the force of the stream used. Any or all of these properties can be used at the same time in treating diseases by hydrotherapy.

Action of Water in Health.—The most important means employed in hydrotherapy is the application of water to the skin surfaces. It acts upon the nerve endings by heat, cold and impact. The nerves transmit the effects to the brain, where it may be switched off and sent to any part of the body. Thus the amount of blood at the body surface can be increased or decreased. The speed of the blood current can be altered and the blood itself improved. More blood can be sent to the brain, thus securing greater mental activity; or less blood being sent there sleep will follow. The pulse can be increased or decreased in force. The breathing may be increased in frequency and depth. The muscular system, too, is affected by the increased activity and the kidneys do more work. The body temperature can be directly affected. It is raised by hot and lowered by cold water. Three conditions, however, will be found to modify the last statement; these are the degree of temperature used, the length of time it is allowed to act and the manner in which it is applied.

THE PRACTICE OF HYDROTHERAPY.

Ablution.—This is the simplest and most widely-used method of applying water. It is effective in many diseases and is a good introduction to the other more active measures.

Definition.—Ablution is the application of water by the hand, without or with a bath-glove or washcloth. Sponges are not rough enough. The bare hand or a rough cloth can be made to produce just as much friction as is desired.

Method of Applying.—Have ready several vessels of water at the temperatures desired. In acute fevers with a temperature above 101 degrees Fahrenheit, first the patient should be stripped completely and covered with a blanket, remove the pillow, roll the patient upon his left side in the portion of the bed away from the one where you desire to work; lay upon the bed a rubber sheet or oil cloth, covered by a blanket. This should be so placed that its near edge will overhang the bed, while the remainder is tucked against the patient's back. He is then rolled over again toward the nurse, while the rubber sheet and blanket are smoothed out on the opposite side of the bed. The patient can now be rolled upon his back, and you are ready to begin the bath. If the patient is a child he can be lifted from the bed, wrapped in a blanket, while the rubber sheet is being adjusted. Beginning with water at 65 degrees, first wash the face, dip the hands into the water and rapidly but gently apply it to the part, using gentle friction; next go to the chest, forearms, back, abdomen and legs as far as the knees. Repeat the process in the same order, but with water at a lower temperature, and so on until water at a temperature of 50 degrees is used. The ablution is continued until slight chilliness is produced. When the effect is sufficiently marked the patient is dried and allowed to remain perfectly quiet, with only a sheet or light blanket over him. Do not attempt to replace the nightgown until reaction is fully established. If sleep follows let the patient remain undisturbed until he awakes.

In vigorous persons with high temperature the effect may be made more pronounced by not drying the parts, but by simply spreading a sheet over the patient and allowing him to dry gradually. Care must be taken not to produce chilling.

In Chronic Affections.—Ablution is useful as a beginning treatment. It may be used in the following way. A bed is prepared as described above; the patient is then stripped and laid upon the under blanket, with the arms raised above the head. The blanket is then folded over the body and between the limbs, hugging the surfaces closely at all points. The arms are now brought down close to the sides and the other side of the blanket laid over all and tucked in around the neck and under the feet. This should be done in a warm room and the patient given sips of cold water to drink at intervals of a few moments to promote sweating. More covers may be used if needed. After a half to one hour the patient's face is bathed in water at 50 degrees Fahrenheit. The blankets are now loosened and each part—arms, chest, back, abdomen and limbs—bathed in turn in water at 80 degrees. They are then dried and replaced under the blanket. A dry rubbing with hands or a towel follows and a short period of exercise is then ordered if the patient is able. If unable to exercise he should remain in bed and take a cup of warm liquid food. Morning is the best time for this procedure, but is useful whenever it can be had.

General Ablution.—The next step in the training is a general ablution. The patient stands in twelve inches of water at 95 degrees, and is quickly washed from head to foot by pouring water upon him and rubbing at the same time. The heat of the water will vary with the patient and his length of training, from 80 degrees to 50 degrees. The great importance of care in these measures cannot be too deeply impressed upon all who undertake them. In chronic conditions the patient must be wooed back to health slowly, realizing all the while that a very small accident may destroy the results of weeks of patient care. It is not sufficient to advise a sick man that he should bathe in cold water every day. He must know just how, when and where, and also how long the bathing should proceed, and what changes are needed and when they should be made.

When May Ablution be Used?—General ablution may be used in febrile diseases to reduce fever and at the same time prevent its rise. In mild cases of infectious fevers like measles it may be all that is necessary throughout the attack; typhoid fever, in which the temperature does not go above 102½ degrees; in severer cases more extended baths are indicated. In chronic cases of anemia and chlorosis, which are due to poverty of the blood; tuberculosis of the lungs, rheumatism, gout and loss of nervous tone. In the most severe cases of the last class it is a good introduction to more severe treatment.

The Half Bath.—How applied: Into an ordinary bath-tub enough water is run to cover a patient's hips and limbs. The temperature may vary from 85 to 70 degrees. The patient enters the bath, or, if too weak, is placed in it. A wet towel is wrapped about his head and the nurse proceeds to bathe his face and then dash the water over his body with a ladle. At the same time the patient's back is rubbed by the attendant, while the patient himself rubs his own chest and abdomen. Cold water is added gradually and the process continued until the patient shivers. He is then removed before chilling ensues and dried before returning to the bed. This is a more stimulating procedure than ablution.

When Used.—In chronic diseases, after the wet pack or procedures yet to be described, the half bath naturally follows to insure the closing of the pores and general reaction. It should continue from five to ten minutes. The patient should be rapidly dried, and in fever cases this may be done in bed.

Affusion.—Definition: Affusion is a bath by pouring.

How Applied.—The patient may sit or stand in an empty tub or lie upon a rubber-covered cot while water is poured upon his head, shoulders and body in a stream from a bucket, pitcher or basin. The temperature of the water may be varied from 65 to 50 degrees, and may be poured from different heights. The stimulation will vary with the temperature and height. The reclining and sitting postures are used for acute cases and the standing for chronic.

Indications for its Use.—When patients are unconscious or delirious and seem absolutely exhausted, ablutions will often result in very surprising improvement. In advanced fever cases, when collapse is threatened, instead of injuring the heart action, they help it materially. In the collapse of children's diseases a warm half bath, with affusions over the head and chest, will often restore completely. In diseases of the lungs, when breathing is difficult; in scarlet fever, with very high temperature, they will bring relief when all other methods fail. They are a better stimulant to the circulation than the most powerful medicines. In brain fever or meningitis, sunstroke and the brain symptoms of pneumonia they are the most useful agents known.

The Sheet Bath.—Method of applying: Protect the bed by a rubber sheet, spread a blanket upon it, have ready several linen sheets, a basin, a tub of water as cold as desired, 50 to 80 degrees, and nearby on a chair place a cup and sponge. The patient should be undressed and ready, wrapped in a blanket or woolen gown. Wash the face with cold water and wrap a cold wet towel about the head. A sheet is now quickly wrung out of the water selected and spread evenly upon the bed. On this the patient is laid, and while he holds his arms up over his head one side of the sheet is brought over and tucked in on the opposite side and between the limbs. The arms are then brought down, and the opposite edge of the sheet is carried over and tucked in around the patient's neck and feet. In feeble patients the arms may be left out and bathed separately during the process. The first effect of this procedure will be a shock to the surface nerves by contact with the cold wet sheet. For a moment the breath will come in gasps and some shivering may follow. These quickly pass away as the nurse begins to rub the body by passing the open palms swiftly over all parts of the body and limbs. As soon as reaction follows, begin to pour water at 50 or 60 degrees temperature from the cup or squeeze it from the sponge over the body, rubbing at the same time with the other hand. Keep this up until the patient is cooled as much as desired or until he is on the verge of a chill. The combination of friction and cold water application through an enveloping sheet is an admirable way of securing the abatement of fever. To increase or prolong the effect allow the patient to remain in the cold sheet, covered by a blanket, from a half to one hour. If he sleeps do not disturb him until he awakes. When it is desirable to end the bath, remove the sheet, dry the patient quickly, place him in a dry bed and cover lightly.

Drip Sheet Bath.—How applied: This is applied while the patient is standing. The room should be at 70 degrees or over. Place the patient, completely stripped, in a foot-bath of water at 100 degrees Fahrenheit and six inches deep. A sheet is now removed from a bucket of water at 70 degrees and rapidly wound about the patient in the following manner. The right arm is held above the head while the edge of the sheet is placed upon the right breast. The sheet is then carried backward under the arm, which is now lowered, and serves to keep the sheet in place. The edge is now carried over the left shoulder, across the breast, over the right shoulder, and tucked in snugly about the patient's neck. As soon as it is in place the nurse proceeds to stroke the body rapidly from head to foot over the sheet and slap it more or less vigorously. Water at 60 degrees is poured upon the head at intervals of a few moments and the rubbing continued between the dashes of water. The process is kept up from five to ten minutes, according to the condition of the patient and his requirements. At first it should be very short in order not to weary him; gradually it can be lengthened as the power to react increases. After the bath dry rapidly then rub with a warm towel or sheet. This bath is applied once a day and best during the forenoon.

Uses of the Drip Sheet Bath.—Many chronic ailments are benefited by it, such as chlorosis, anemia, neurasthenia, intestinal catarrh, melancholia, neuralgias, pulmonary and bronchial diseases. Its application can be varied in a great variety of ways.

The Cold Rub.—Definition: This is a modification of the drip sheet and is generally applied immediately after the patient arises in the morning and while he is still warm.

Application.—A coarse linen sheet is wrung out of water at 60 to 75 degrees and quickly wrapped about the patient in the manner described above. Friction is now applied rapidly over the sheet, accompanied by slapping, the object being to produce a definite reddening of the skin.

This is only a short process, and when finished the sheet is dropped and the patient quickly dried. After dressing and drinking a cup of hot milk or cocoa the patient should take a walk in the open air.

Uses.—In anemias of feeble patients, tuberculosis of the lungs, any case lacking in blood.

The Wet Pack.—How applied: The method is very similar to that described in the preparation for ablution. The body is, however, first enveloped in a wet sheet in the manner described, so that it will lie in contact with every part of the body. The sheet should be wrung out of water at 70 degrees, or even as low as 60 degrees. Over this a blanket is folded so snugly that all outside air is excluded. A wet towel is folded about the head like a turban. If the patient feels cold more blankets are placed over him. He should remain in the pack from a half hour to an hour. It should be followed by some form of cold application to restore tone to the skin. A half-bath, heat bath or cold ablution will serve this purpose.

Uses.—If it is desired to abstract heat the sheet should be 60 to 70 degrees. When it has become warm replace by one a few degrees colder on a fresh bed, and so on until the desired body temperature is reached. It is estimated that five baths, each of ten minutes, will equal a full bath of fifteen minutes' duration. With temperatures varying between 100 and 103 degrees this is an excellent procedure. When used to quiet restlessness and promote sleep the higher temperature of water is used, say 70 degrees, and the patient is allowed to remain in the pack until he awakes; he is then given a rapid cold ablution. The wet pack is useful in most of the acute fevers at the outset. The addition of salt or other medicines to the water is sometimes advised.

In Chronic Diseases.—In these cases the pack should not be quite as low in temperature. The cold stage lasts longer, reaction comes on more slowly, but when it does the soothing and refreshing effect is very evident. The whole body is in a sort of water poultice. It is valuable in functional nervous diseases, hysteria and some heart troubles. In tuberculosis of the lungs, with fever, it is found very effective. In diabetes, rheumatism, gout and digestive disorders, anemia and chlorosis it has proved very effective.

The Wet Compress.—This is probably the most extensively used of all hydriatic procedures. It is in fact a local wet pack.

Method of Use.—Several folds of old linen or cotton, gauze or cheesecloth, sufficient to cover the part to be treated, are wrung out of water at the proper temperature and placed upon the part. A dry flannel or piece of oiled silk or rubber band sufficient to cover the compress follows, and over this a retaining bandage.

The Head Compress.—Take a linen towel wrung out of water at 60 to 75 degrees and apply it like a turban to the head. This is used to prevent congestion of the brain and during all hot baths and wet packs.

The Throat Compress.—It should be made and applied as follows: A piece of flannel, 8x24 inches, is made ready; then a compress of soft linen, four inches wide and long enough to reach from one ear under the chin to the opposite ear, is soaked in the water at 60 degrees and laid upon the throat; the flnannel bandage is next placed on it and drawn up snugly over the head, to be fastened by pins. A slit for each ear to be cut in the flannel if it is uncomfortable. Two bandages are made so that one can be dried while the other is in use. In children it is wise to first put a band around from the back of the head to the forehead, to which the upper bandage can be pinned at the intersections.

The Chest Compress.—Make two jackets out of three folds of old linen. They should be large enough to reach from the neck to the waist and entirely around the chest. At the points, by measure, where the two armpits will come cut a deep slit so that the arms may sink in far enough to allow the ends to be pinned over the shoulders from front and back. Cut two pieces of close-woven flannel of the same shape as the jackets, but about an inch larger in every direction. Roll up one of the compresses and wring it out of water at 60 degrees. Spread it upon one of the flannel covers and roll them up together half way. Now, with the patient gently turned on to one side, spread the unrolled portion on the bed behind him, so that he can be rolled back upon it in just the right place, to fit. Now unroll the remainder and bring the ends together across the chest, fastening them with safety pins. Also pin the portions at the top over the shoulders. This compress should be changed every half hour when the temperature is 102 degrees or over, hourly when the temperature is below that and down to 99½, when it should be stopped. Always have the fresh compress entirely ready before loosening the first. Thus, one movement of the patient will be sufficient to remove the old and apply the new compress. Use fresh water at 60 degrees each time and always rinse the compress between using to keep it clean. Continue the changing night and day unless the patient is asleep. By being so thorough and careful the patient's chest will never be without a compress except at the brief moment when one is being rolled from and the other being unrolled upon his body. If stupor and low muttering delirium is present use water which is colder than 60 degrees, also throw a few dashes of ice water on the chest before placing the fresh compress. When insomnia is marked use water slightly warmer than 60 degrees. These methods are used in croupous and broncho-pneumonia.

The Hot Fomentation Compress.—Two or three folds of flannel, as large as desired, are wrung out of boiling water, making it as dry as possible. The part should be anointed with vaseline and the hot flannel applied as quickly as possible, so as not to lose any of its heat. Surround the patient with a dry blanket over the compress. It may be necessary to lead up through several temperatures before the very hot compresses can be used. These compresses should be renewed every ten or fifteen minutes until the patient sweats. After the pain is relieved the body may be carefully uncovered and quickly rubbed dry or washed with water at 75 degrees, accompanied by friction. In sciatica nothing exceeds this method of treatment. In lumbago and other muscular rheumatisms a hot fomentation each night will soon result in relief.

The Heart Compress.—Wring out a piece of linen from water at 40 degrees and lay it upon the heart. On this place a rubber coil and pass ice water through it. A flannel binder will keep all in place. This is especially useful in irregular heart action, due to nervous conditions, in rapid heart action in some very weak patients. It will also be effective even when digitalis has failed. It can be used in a course of severe fevers, such as typhoid.

The Cold Full Bath.—By this is meant the placing of the entire body in water 10 to 30 degrees below the normal body temperature for from five to twenty minutes. It is this form of bath which has revolutionized the treatment of typhoid fever. Its application varies with the ends in view. In acute cases it should be applied as follows: A movable bathtub is provided, if possible, and rather than use the ordinary house bathroom an improvised bath apparatus is advisable.

Method of Applying a Tub Bath.—When the tub is ready the patient is stripped and a breech-cloth applied, or he may be left enveloped in a sheet. A stimulant is then given, either hot coffee or half an ounce of whiskey. Two attendants then lift him carefully from the bed and place him directly in the bath. A towel soaked in cold water is bound about his head. The head is supported by a strip across the tub or a rubber cushion. If neither of these are available one hand of the attendant must support the head while the other is employed in the rubbing process. Both attendants vigorously rub the patient from head to foot. From time to time fresh cold water is poured upon the head and face. The rubbing is an absolute necessity in this form of bath. There is always some shock when a patient is placed in cold water, but under brisk rubbing the surface is warmed and stimulated, so that there is a continuation of little shocks and reactions. As rapidly as the surface is cooled the blood is pushed forward and fresh hot blood from the deeper parts takes its place and is in its turn cooled. The process continues thus until the temperature falls sufficiently or the bath is continued long enough, or the danger of severe chill makes it wise to end the bath. The bed in the meantime has been spread with a blanket and dry linen sheets; the patient is lifted from the bath and placed upon the bed. The sheet and blanket are then folded over from one side under the raised arm and tucked between the limbs, then the other half over the arms, so enveloping the whole body. Very frequently he will fall asleep. If shivering is prolonged it is an evidence that the bath has been too cold or too long, and a change should be made at the next application. If reaction does not come on promptly hot water bottles or bricks should be placed to the feet and between the limbs. Friction must always be used in the cold bath treatment. If it is neglected the bath will really be a cause of increasing the fever by closing the pores and contracting the surface blood-vessels.

The Warm Full Bath.—The warm bath is one in water a little below the normal body temperature. Hot baths are those with the temperature above the normal body temperature. These baths should be arranged so that the temperature may be increased after the patient is in the water, either by kettles of hotter water or by gradually increasing the water from a hot faucet. They should last from five minutes to an hour, according to the object sought and the conditions being treated. Their general effect is soothing, although the very hot baths are stimulating; for example, those of the Japanese at 130 degrees Fahrenheit. Warm baths are useful in relieving pain and nervousness, reducing temperature, the latter especially in children and infants. Care should be taken to dry thoroughly after baths and protect from draughts.

The Hammock Bath.—The hammock bath is a means of applying the effects of water through long periods of time. An extra deep tub is used, the patient is swung upon a strong sheet which is fastened to the edges of the tub or to a frame work over it, so that the water surrounds him up to his neck. Constant renewal, by the inflow of water at a given temperature.

The Douche.—This is the application to parts or the whole of the body of a stream or streams of water at varying temperatures. Moreover, the stream should be under different degrees of pressure. When the stream is made to take a form which is broad and flat it is called a fan douche.

This is made by partially closing the outlet or nozzle by the thumb or finger. The shower bath is another form. In this the pressure ought to equal the fall from a cistern fifty feet above the outlet. The needle or circular bath is one in which the water is forced against the body in fine jets from all sides at once. The ascending or bidet douche is one in which a jet is directed upward from below, usually while the patient is sitting, and is used in rectal treatment to overcome piles.

The Hip-Bath.—The hip- or sitz-bath, as its name implies, is one applied to the lower part of the body only. The bath is first prepared, then the patient stripped, a wet towel bound about the head and a warm blanket about the feet. Sometimes it is wise to add a hot water bottle with the foot blanket. When the patient is in the bath the under side of the knees should not rest upon the tub; if they do a stool should be placed under the feet. Rapid friction should be used over the parts in the water by an attendant and also the patient himself. When the bath is over dry the patient and have him return to bed for a short rest, or, if an invalid, remain there. Hot baths are 104 to 110 degrees Fahrenheit, cold baths as low as 50 degrees. All grades between these are used. The duration of hip-baths may vary very greatly. Hot hip-baths are used to overcome pain in the abdomen and pelvis, to reduce inflammation of the pelvic organs, to cure cystitis, urethritis, uterine hemorrhage, diarrhœa and dysentery, and especially vesical straining.

Uses.—Cold hip-baths of short duration are stimulating and are used to overcome muscular paralysis or loss of tone, in prolapsus of the rectum, spermatorrhea, prostatorrhea, impotence, weakness of the uterine ligaments, prolapsus of the uterus, the leucorrhea of chlorosis, stoppage of the menses, passive bleeding, constipation and flatulency.

Steam.—Vapor of water, with or without medicines, has been used for softening the mucus in case of croup, laryngitis, false-croup and diphtheria. A tent or canopy is arranged over the patient and the steam conducted under this from one or more kettles kept heated by alcohol lamps or any other available method. When nothing else can be found heat some bricks or stones and drop them into buckets of water under the tent until sufficient steam has been generated. Steam is also used to check bleeding by some surgeons; also as a cleansing agent in some operations for cancer.

The Turkish Bath.—This, as its name implies, has come down to us from the Turks, and they obtained it from the Arabians. It consists first of a sojourn for a considerable time in a hot-air chamber, with a temperature from 105 to 125 degrees. The patient remains in this room until he is in a thorough perspiration; he is then laid upon a table and an attendant rubs him thoroughly with his hands and kneads the flesh from head to foot. The attendant scrubs him with soap and water, using a brush, and finally washes him off with warm water. After another short stay in the hot room the patient stands for a few moments under the shower bath and is then wiped dry. He then passes to what is known as the "cooling off" room, where he lies quietly upon a cot; the temperature of this room is usually 80 degrees. A quiet sleep will often follow the bath, and after it the patient should be rubbed with alcohol and take a cup of coffee or chocolate before dressing and leaving the bath.

Russian Bath.—This bath differs from the Turkish in that the first chamber is filled with steam instead of dry air, and the final process before drying is a cold plunge into a tank or swimming pool. The latter may be replaced by pouring cold water over the bather. The last two methods are used to reduce flesh, particularly in corpulent individuals. In well-nourished, rheumatic and gouty patients, in neuralgic affections, in persons of this same class, these baths will be especially beneficial.

HYDROTHERAPY IN SPECIAL DISEASES.

Typhoid Fever.—The following methods may be used in treating this disease:

1. Ablutions and compresses until the temperature has reached 103 degrees, or when the cold baths are impossible.

2. The cold bath; a bath at 65 degrees, lasting fifteen minutes, whenever the temperature rises to 102½ degrees, in the rectum.

3. If this method is not advisable the Ziemssen half-hour baths may be used, where the water is reduced gradually from 90 to 70 degrees.

4. In very weak, nervous patients, coming under treatment in the second week or later, only five- or ten-minute baths at 88 to 95 degrees, followed by short cold affusion, or a wet pack, should be risked. The temperature and duration of the bath can be altered with the improvement of the patient.

5. The hammock bath, as described above, can be substituted in treating very timid patients.

Measles.—With a temperature at 103 degrees a bath of ten minutes in water at 95 degrees is very soothing. It should be repeated every four hours and the water temperature reduced five degrees each time until the desired effect is produced. The patient generally falls into a quiet sleep after such a bath. When the full bath cannot be given ablution may be used rapidly, but without friction. Cerebral symptoms should be overcome in this way. The half-bath can be very successfully used in measles. This may be repeated oftener than the full bath. Do not wait too long before beginning the water treatment. If the patient's nervous tone is kept high by the above methods there will be less likelihood of any lung complications beginning.

Scarlatina.—In the early stages, before the diagnosis is sure, a warm full bath at 100 degrees, for a few minutes, will quiet the patient wonderfully. If the heart action is feeble, the bath should be followed by a few dashes of cold water over the shoulders and chest, or the latter method may be used without the full bath. In urgent cases an effusion may be used every hour until reaction is sufficient and the heart is relieved by bringing the blood to the surface. When the eruption is well out and the mind clear there is not much need for treatment; but when temperature is high or mind clouded and congestion evident ablutions with water at 90 degrees, gradually reduced to 75 degrees, are very effective. The time occupied in single ablution should be short, as it is the nervous system that we wish to effect more especially. The number of ablutions will depend upon the result obtained. It may be necessary to have them repeated every hour.

Pneumonia—1. In Children.—Begin bathing when the temperature reaches 103 degrees, or earlier if nervous symptoms are marked. The bath should begin at a temperature of 95 degrees and last for ten minutes. They should be repeated every four hours, and the temperature of the water decreased two degrees each time until 80 degrees is reached. Never omit friction. Between the baths, in bad cases, use the chest compress every one or two hours. If alarming symptoms appear, or heart failure is feared, place the child up to the waist in a bath at 100 degrees and dash several basins at 75 to 65 degrees over the shoulders. Follow this with rapid friction and drying. Repeat this process as often as every two hours if necessary. Crying and coughing are caused and they are a wonderful help in relieving the congestion. In less severe cases, wet packs, ice jackets or cold sponging may be sufficient.

2. In Adults.—The greater difficulty in applying baths to adult patients and the fact that practically as good results can be secured in another way, have led to the adoption of the latter plan, which is the chest compress. The full bath can be reserved for the more urgent cases. The warm half-bath and cold affusion to the chest is also exceedingly valuable in emergencies.

The Chest Compress.—This has been described in the foregoing pages.

Do not neglect the careful observance of all the details. Usually a temperature of 60 degrees is best, but in cases with stupor or muttering delirium a lower temperature will be needed. Dashes of ice water can be used when the compress is being changed. If there is sleeplessness or excitability allow the compress to remain for two hours, or even longer, without changing; this will increase its soothing effects.

Acute Cholera Infantum.—The element of shock in this disease is so decided that the attacks resemble sunstroke. The internal temperature is often very high indeed. Reaction must be secured quickly or it will be too late. It is sometimes necessary to proceed with these measures before attending to any of those which logically precede, as indicated above. Prepare a bath at 90 degrees, wrap a cold cloth about the child's head and have it supported by an assistant. Lower the child's body into the bath, holding it by the hands and feet. Begin gentle friction over the different parts of the body, arms and legs to the elbows and knees. Have another assistant remove water from the bath and replace it with ice water until the temperature falls to 80 degrees. Continue the bath ten minutes, or if shivering occurs before that time remove the child. If the temperature has been very high follow the bath by a wet pack and a blanket over that. Put hot bottles to the feet and keep the head cool. If the symptoms are not so urgent a wet pack alone may secure the desired reaction.

Sunstroke.—Put the patient upon a rubber-covered cot, cover him with a sheet, dash upon him, at intervals, dipperfuls of cold water in the meantime keeping up constant friction over all parts of the body and limbs. Keep an ice-bag or cold cloth upon the head, and occasionally pour ice water upon the forehead from a height of six feet. The friction must not be neglected under any circumstances. When the rectal temperature has fallen to 104 or 103 degrees wrap the patient in dry blankets, with hot bottles to the feet and limbs. Usually the patient will fall asleep and break out in a gentle sweat. If reaction does not occur and the temperature again rises repeat the above treatment. Continue thus until the temperature remains down. As soon as the patient can swallow give small drinks of ice water at frequent intervals.

Anemia or Lack of Blood.—Here we must distinctly understand that we are not to abstract heat from the body. On arising in the morning the bath should be taken as follows: In a room the temperature of which should not be lower than 68 degrees. Let the patient stand in water at 100 degrees and pour over him water at 80 degrees and at the same time have him rubbed thoroughly and let him rub himself. Reduce the temperature of the water 2 degrees each day. Dry rapidly after the bath, dress and let the patient take a short walk in the open air. In weak patients the dry pack may precede the ablution.

Consumption.—To give a consumptive patient full benefit of the water treatment it should be begun and carried out systematically. If the body is already well cared for the treatment can begin at once, if not, a good warm water and soap bath must be given on the first day, and then the following day proceed thus: Strip the patient entirely naked, wrap him in a blanket, cover him with other blankets and give small drinks of water at short intervals, say every ten minutes. During this dry pack the windows may be wide open even in winter. After an hour has passed wash the face with quite cold water and dry. Have a basin ready with water at 75 degrees, remove one arm from the covers and wash it briskly with the wet hand or with the hand covered by a bath glove. Rub well and then dry and replace. Do the same with the other arm, then the different parts of the body successively. At the end rub the entire fody with a rough towel. Repeat this treatment daily until, by reducing the temperature 2 degrees daily, the water is used at 60 degrees.

Neuralgia.—In this trouble great relief has resulted from the various water methods of treatment. Especially good results have followed when rapid contracts of temperature have been used like that obtained in the Scotch douche. In sciatica this treatment has been wonderfully successful.

Chronic Rheumatism and Gout.—These cases may be divided for treatment into two classes:

1. The Well-Nourished Subjects.—These should be given full baths for from eight to fifteen minutes, in water at 95 degrees, gradually raised to as high a temperature as can be borne; gentle massage to be given during the bath. Allow the patient to drink large quantities of water both during and between the baths. The bath should be followed by sweating between blankets. These baths should be given daily, or less often according to the patient's condition and progress. Between the baths cold wet compresses at 65 degrees can be bound upon the affected parts and allowed to remain until almost dry. Such compressses may be used during the night. A sweat in the cabinet for five to fifteen minutes followed by the douche at 100 degrees, reduced to 90 degrees during the progress of the bath, will be found very useful after the above courses.

2. The Poorly Nourished.—Hot baths must be used very cautiously and infrequently in this class of treatment. Once or twice a week will be found sufficient. Ablutions gradually decreased in temperature are most effective. Scotch douches to the joints, followed by cold compresses, should also be used. As the patient becomes more used to lower temperatures the baths may be made more stimulating. More food will be taken, digestion improved and the patient gradually increase in weight and strength.

Dyspepsia.—Catarrhal and nervous types of this disease are recognized. The treatment is similar to that for anemia. As a local stimulant the Scotch douche over the region of the stomach is very effective. The hygienic rules must be carefully remembered during the treatment of this condition. The daily cold plunge bath, or its equivalent, will be a great help.

THE INTERNAL USE OF WATER.

Effects.—Drinking cold water slows the pulse and makes it stronger and fuller. Hot water weakens and makes it rapid. Cold water is the best diuretic, warm water the best diaphoretic or sweating agent.

Acute Infectious Diseases.—The methods of using cold water externally in the treatment of acute diseases has been detailed in the previous pages, but the good effects of that treatment will often be lost unless enough cold water is given internally. At least a glassful of cold water should be drunk every two hours by a patient suffering with fever. The drinking of so much water insures a good flow of urine and increases the perspiration.

Gastric Catarrh.—A pint to a pint and a half of water, taken a half-hour to an hour before meals so hot that it cannot be drunk but only sipped, will cleanse the stomach and prove an excellent stimulant to the muscular walls of that organ. This method of treatment has been very widely employed but has often failed because the water was not drunk at a sufficiently high temperature. The administration of water to babies has already been mentioned.

HEALING BY SPECIAL SCHOOLS AND METHODS.

ECLECTIC MEDICINE.

Name and Principle.—The name eclectic means choosing, and it refers directly to the means used for treating disease. It implies a selection of methods and remedies from all other systems of practice. "The great principle upon which eclecticism is based is: *that disease, wherever met, and in whatever form manifested, is an impairment of vitality; that causes of disease are depressing and, whilst they exist, lower vital powers.* The corollary from this is, *that all agencies employed in the treatment of disease should act in one of two ways—removing the depressing cause, and increasing the vital powers for better resistance and subsequent restoration of structures and function.*"

Belief.—The eclectic schools of medicine believe in the curative power of nature. They claim that medicines can be useful only as they aid nature in her endeavors to cure the diseased condition.

All the remedies known as antiphlogistic are discarded: bleeding, mercurials, antimony, and so forth. They avoid the use of mineral poisons for medical purposes. They seek to remove the cause of disease through the natural outlets of the body, and foster those measures which result in a better renewal of life. They treat the cause rather than any special symptoms which result from its presence.

CONDITIONS OF HEALTH.

1st. A general bodily expression of vigor, the face being the chief indicator.

2d. No painful or unpleasant sensations should be present.

3d. The bodily heat should be 98.4 degrees Fahrenheit.

4th. A pulse of 72 beats each minute, regular in force and time.

5th. A good appetite and digestion, with a daily bowel movement.

6th. The skin and kidneys should be acting normally.

7th. Well-balanced nervous system and a clear eye.

CONDITIONS OF DISEASE.

Any deviation from the condition just described would constitute disease, but we do not usually speak of a condition as disease until it has been in existence long enough, or become strong enough, to make its presence inconvenient or troublesome to the patient. The following are some of the conditions which indicate disease:

1st. The face of the patient, his position and actions show signs of suffering.

2d. The temperature may vary widely from the normal. It may fall to 95 degrees or lower, or rise to 107 degrees or more. The presence or absence of fever can be discovered to some degree by the hand, but far better with a thermometer.

3d. The pulse may be increased or decreased in frequency; may become harder or softer than normal; may be irregular in rythm or force.

4th. The stomach and bowels may be disturbed, and this will be indicated by the condition of the tongue.

5th. The urine and discharges from the bowels may be very much altered. The skin will be rough and harsh to the touch, and during fever, hot and dry.

6th. The nervous system may present a great variety of symptoms. The eye will be dull and heavy except in special diseased conditions.

ECLECTIC DIAGNOSIS.

A consideration of the symptoms present in a given case leads to a conclusion regarding its character. That is called making a diagnosis.

Diseases are known by their features in the same way that we know our friends and relatives by their features.

ECLECTIC TREATMENT.

The medicines and methods used in caring for a sick patient are termed the treatment. These will be indicated in connection with each condition as it is described later. One thing only need be said here: "*Never give medicine unless you are positive that it will relieve present discomfort and shorten the duration of disease.*"

FEBRILE DISEASES.

Fevers are of two classes: 1st. Those which have a local cause in one or more of the organs of the body; 2d. Those in which no such local cause is found, but in which the fluids of the body are involved in disease.

Phenomena of Fevers.—The advent and course of a fever is, in general, as follows: 1st. A period of gradual approach called the *incubation period* or *onset*. It is known by the feeling of weariness, dry skin, cold hands and feet, loss of appetite, with headache and disturbed sleep.

The Cold Stage.—2d. This is usually known by the chill which occurs. Severe headache and backache. The hands and feet become icy cold, the lips are blue and the face very pale. This stage may last only a few minutes or may be prolonged to several hours.

The Hot Stage.—3d. At this time the pulse becomes rapid. The color returns to the face and is increased. The body heat rises, sometimes very high. The skin remains hot and dry. The length of this period varies greatly in different fevers. Following it we have

The Stage of Decline.—4th. This leads to recovery. The various symptoms become less and less severe. The skin becomes moist. The secretions begin again and gradually all the functions resume their normal course.

Fevers are divided into two classes according to their course: intermittent and continued.

INTERMITTENT FEVERS.

Treatment.—This class of fevers are the result of poisoning by malaria. In the stage of onset they may be aborted by a brisk purge, an emetic and a sweat. In the cold stage the patient should be treated by a hot mustard foot-bath and then placed in bed, well covered by blankets, with hot bottles or bricks to the feet and limbs, and given frequent drinks of *ice* water or very hot coffee or water. During the hot stage cold drinks should be administered; the body frequently sponged with cold water, and then lightly covered and protected from drafts.

Between attacks the patient should remain in bed if he is at all prostrated. He should be given quinine in large enough doses to cause the ears to ring. It is best given in solution. The following prescription is a good one:

℞.—Quinine	ʒij
Aromatic sulphuric acid	f℥i

Give half a teaspoonful in a glass of water every three hours. A double dose should be given about two hours before the time of next expected chill.

When the stomach will not retain quinine it may be used in an ointment:

℞.—Quinine	ʒi
Lard	℥ij

This should be rubbed into the skin, especially the parts under the arms and on the inside of the thighs. The amount above indicated should be used every day if the patient is an adult. It will be sufficient for four days in a child five years or under.

When Quinine Fails.—When quinine fails, or is too slow in its action, the following may be used:

℞.—Strychnine	gr. ij
Dilute muriatic acid	f℥ij

Water enough to make half a pint. Give one teaspoonful every three hours to an adult. Another remedy is common salt:

℞.—Salt	℥iij
Powdered elm	ʒiij
Boiling water	½ pint

Give a teaspoonful every two hours during the absence of the fever.

CONTINUED FEVERS.

Febricula or Little Fever.—This may be caused by a single cold, by constipation (especially in children), catarrh, simple sore throat, indigestion and slight congestion of the lungs.

Treatment.—Relieve the bowels, if necessary, by an enema. Place the patient in a full warm bath, rub briskly after it, and follow with a hot mustard foot-bath. Place him in bed between blankets and give frequent cold drinks until he sweats. Allow him to sweat for half an hour, then rub dry and remove all but the lightest blanket. Allow him to go to sleep and he will probably wake up entirely recovered.

TYPHOID OR ENTERIC FEVER.

There are three conditions of this fever which have received separate names: 1st. Those which are so mild that they are not usually considered to be typhoid at all, and known as synochal fever; 2d. Those that are somewhat more severe, but run a shorter course than most cases of typhoid, and are called synochoid fever. They are, however, all caused by the same poison and should be classed with (3d) *Typhoid Fever*.

Typical Typhoid.—A typical case of typhoid fever has a stage or period of onset covering about one week. The usual symptoms of that stage will be present, but the gradual daily increase of fever will be quite apparent. The face will acquire a dull, spiritless aspect and the patient may be somewhat drowsy. About the eighth day a few fine, so-called, rose spots will appear upon the abdomen. Their distinguishing feature is that they do not disappear entirely when the skin upon which they rest is stretched. This fever is self-limiting, so that the treatment is nearly all comprised within the field of good nursing.

Diet.—Certain rules, however, must be adhered to very strictly. No solid food should be given at any time during the illness. Liquid food should be given every two or three hours, according to the needs of each case. At times it is necessary to awake the patient during the night to give nourishment. Milk, beef tea, albumin or white of egg, the entire egg raw, and beef extracts will be found useful.

The Bath.—Plenty of water should be given if the patient desires it. A soap and water sponge bath should be given daily. As often as the temperature goes above 102 degrees Fahrenheit an ice-water sponge bath, with friction, should be given. If these do not prove sufficient to keep the temperature under control full tub baths should be used. The water should be 85 degrees Fahrenheit when the patient is placed in it. Ice is then added gradually until the water is only 65 degrees Fahrenheit. Rubbing should be employed during the entire bath, which should continue for 15 or 20 minutes, or until the patient's teeth are beginning to chatter. He should be lifted out and quickly dried, then laid on the bed with a blanket over him until reaction follows. The blanket is then replaced by a sheet and the patient allowed to sleep if he desires. Usually a stimulant is given before each tub bath. This may be half an ounce of whiskey or brandy.

Disinfection.—All urine and bowel discharges should be disinfected before being thrown out. Probably the best thing to use for this purpose is a saturated solution of *Chlorinated Lime* or Bleaching Powder. Use a tablespoonful to each pint of the discharges, mix it well and allow the mixture to stand for five minutes before emptying.

The giving of medicine in this fever ought to be under a doctor's care, and there are so many possible complications that may arise that it is always wise to have a physician in charge of the case.

TYPHUS FEVER.

Symptoms.—This is sometimes called camp fever. It is a well-recognized form of disease, running a definite course, and is due to a special infective poison. Its onset is shorter and more severe than that of typhoid. There is severe pain in the head and back, the former is often retracted in the same way that it is in meningitis. The skin becomes a dusky red and about the sixth day a distinct papular eruption appears.

MEASLES OR RUBEOLA.

This disease is marked at the outset by redness of the eyes and free flow of mucus from the nose. There is usually some sore throat and slight cough, but the throat trouble is not as severe as in scarlet fever.

Treatment.—1. When the above signs appear begin the treatment by bathing the feet in hot water for half an hour; then place the patient in bed and give frequent doses of an infusion or tea made of lobelia and asclepias leaves, equal parts of each. This should be stopped as soon as there is produced any tendency to vomit. Such treatment favors the outbreak of the eruption. After it is fully out continue the same medicine but in smaller doses to relieve cough and quiet any lung symptoms which may be present. Plenty of water should be given and a liquid diet.

2. When the fever is high sponging with tepid water is very soothing and will often quiet a restless patient and produce sleep.

3. For troublesome cough an infusion or tea made from the ordinary red clover hay will be found very useful.

Accessory Treatment.—1. When the chest symptoms are bad a tent may be made over the bed and steam passed under it from a kettle, the water in which has a teaspoonful of the tincture of lobelia to each pint. A cloth spread with carbolized vaseline may be placed on the chest to aid in soothing the symptoms in that region.

2. Care should be taken to protect the patient from danger of taking fresh cold during at least two weeks after all the fever is gone. If care is not exercised in this regard chronic nasal catarrh may result. See that the clothing is sufficiently warm and that the feet are kept dry.

Treatment in Severe Cases.—1. Whenever a case of measles is apparently severe at the outset, the treatment should begin with the following:

Tincture of belladonna	20 drops
Tincture of aconite	15 "
Water	4 ounces

Mix and give a teaspoonful every hour until the skin is relaxed and the pulse less strong.

2. Whenever the eruption is delayed a wet pack will usually bring it out. If this cannot be given an emetic of salt or mustard water will be found effective.

3. For very severe cough following or even during the attack a teaspoonful of the tincture of drosera in a wineglassful of water every four hours will afford great relief.

SCARLET FEVER OR SCARLATINA.

Treatment.—**1.** The sooner the eruption appears the shorter the disease; treatment therefore should first be directed toward that end. We accordingly begin at once with the following:

Tincture of aconite	15 drops
Tincture of belladonna	20 "
Water	4 ounces

Mix and give a teaspoonful every hour.

2. Bathe the body frequently in water in which a little soda has been dissolved. These measures will hasten the appearance of the eruption and can be gradually decreased as the fever subsides.

3. For the throat conditions the fumes from vinegar and water (one part of the former to three of the latter) will be found useful. Also a flannel soaked in equal parts of vinegar and water should be bound around the throat and renewed every hour or half hour during the worst part of the attack and then gradually discontinued as the trouble subsides.

4. In the early stages of very severe cases veratrum may be substituted for aconite in the prescription given above. If the nervous system is much affected replace the belladonna by gelsemium. When the glands of the neck swell badly the following preparation may be painted on the outside every four hours:

Tincture of lobelia	2 ounces
Tincture of aconite	½ ounce
Tincture of arnica	½ "

Or, make a poultice of wheat-bran and a strong tea of lobelia and apply it to the neck. One of the best gargles for patients old enough to use this method is made by adding one-half a teaspoonful of permanganate of potassium to a pint of water.

CHICKEN-POX OR VARICELLA.

Treatment.—**1.** Give a sponge bath followed by a hot foot-bath and hot drinks until sweating follows. If the bowels are costive it would be well to give a dose of castor oil or a seidlitz powder at the very outset.

2. If the fever is high give the following:

Tincture of veratrum	10 drops
Tincture of asclepias	½ ounce
Water	3 ounces

Mix and give a teaspoonful every hour to a child five or six years old.

3. For itching of the skin bathe with the following:

Glycerine	5 ounces
Rose water	5 “
Subnitrate of bismuth	30 grains

DIPHTHERIA.

Treatment.—**1.** First give an emetic if the attack is severe; if not, use the prescription with aconite given under the head of Measles and add veratrum if the fever is high. In the latter condition also we should use the general bath in addition to the hot foot-bath. The bath may be made more effective by adding salt or pepper or mustard to the water. If the feet become cold at any time a hot mustard foot-bath may be used.

2. For the sore throat give every hour a teaspoonful of the following:

Potassium chlorate	3 drachms
Water	4 ounces

If the mouth and throat remain dry use the following:

Dilute muriatic acid	½ ounce
Simple syrup	2 ounces

Mix and give a teaspoonful in water as a drink every two hours.

3. When the aconite has reduced the force of the disease so that the skin becomes soft and moist, stop it and give quinine, one grain every hour until the pulse is full and strong. If the patients are old enough to gargle, any of the following may be used: Chlorate of potash ten grains to the ounce of water; infusion of baptisia; infusion of witch hazel; dilute tincture of phytolacca; or the solution of permanganate of potash thirty grains to the pint of water. The last can be used as a spray or on cotton swabs. Use vinegar and water compresses to the outside of the neck constantly.

POISONOUS BITES AND STINGS.

Treatment.—Give aromatic spirits of ammonia in two-drachm doses in water every hour until reaction follows the shock. Strong coffee is also useful for the same purpose. Slices of raw onion may be bound on the point of injury or sting. Another very good external application is the permanganate of potash solution two drachms to the pint of water.

A COLD OR CORYZA.

Treatment.—Whenever a cold is suspected it may be broken up by giving a half drachm of the tincture of gelsemium and allowing the patient to sleep for a couple of hours. If this cannot be done give a hot mustard foot-bath, place the patient in bed and give hot drinks until a good sweat is secured. If more rapid means are desired give an emetic. Another good method is a wet sheet pack. Give a brisk purge in nearly all cases.

INFLUENZA.

Treatment.—Usually the plan just given for treating a cold will be found equally useful for influenza. If there is fever, or further treatment is needed, give teaspoonful doses of compound tincture of Virginia snakeroot every two hours until the patient is well.

TONSILLITIS.

Treatment.—Use the following spray to the part during five minutes every four hours:

℞.—Aconite tincture	1	drachm
Water	¼	pint

This will usually cut short the attack. Do not allow the patient to swallow the spray. If an atomizer cannot be had apply the medicine on cotton. Equal parts of vinegar and water may be used in place of the above. Apply on the outside flannels moistened with stillingia liniment. If the aconite spray does not cure in two days stop it and paint the tonsils with fluid extract of witch hazel.

ACUTE LARYNGITIS OR CROUP.

Treatment.—This may be the same as that just outlined for tonsillitis, but usually more active measures are needed. The hot foot-bath, steam inhalations and frequent small doses of tincture of lobelia or sanguinaria in simple syrup should be given until free sweating and flow of mucus occurs. Prompt relief will then follow. Dry cups on the outside will be necessary in severe cases. A good free purge should always be secured early in the treatment.

ACUTE BRONCHITIS.

Treatment.—1. Begin the treatment by an emetic of lobelia or mustard water; after it acts give a purgative—the compound jalap powder or compound cathartic pill; follow that with a hot foot-bath and warm drinks until the patient sweats freely, then dry quickly and place in bed. If the attack is not entirely averted by this treatment give the following until recovery is complete:

℞.—Tincture of gelsemium	1	ounce
Acetate of potash	½	"
Water	up to 4	ounces

Mix and give a teaspoonful every two hours.

2. If a stronger expectorant or cough mixture is needed the following may answer:

℞.—Syrup of lobelia	2	ounces
Syrup of senega	2	“
Syrup of althea	2	“
Tincture of hyocyamus	½	ounce

Mix and give a teaspoonful every two hours. (It is well to give quinine and iron as a tonic during convalescence.)

CHRONIC BRONCHITIS.

Treatment.—1. This is often the result of neglect in the course of an acute attack. Its treatment is therefore the same as that used in later stages of acute bronchitis. Cough is usually the most troublesome symptom, and the following mixtures have been found useful in combating it:

℞.—Balsam of fir	1	ounce
Balsam of tolu	1	“
Balsam of peru	1	“
Oil of anise	½	drachm
Tincture of opium	1	“
Honey	2	ounces

Jamaica rum, to make one pint.

Mix, and take 1 or 2 teaspoonfuls every three or four hours. Shake well before using.

2. Or,

℞.—Balsam of copaiba	1	ounce
Balsam of fir	½	“
Sweet spirits of nitre	½	“
Honey	½	“

Mucilage of acacia, to make 4 ounces.

Mix, and take a teaspoonful every four hours.

Inhalations of creosote are also useful—a drachm in a pint of boiling water three times a day.

ASTHMA.

Treatment.—1. Chronic cases have been cured by the following:

℞.—Sulphur	½	ounce
Bruised anise seed	2½	drachms
Confection of senna	6	“
Syrup of tolu	6	“

Mix, and take freely every day; or, one or two teaspoonfuls three times a day, or sufficient to keep the bowels moving easily.

2. Or,

℞.—Sulphur	½	ounce
Anise seed	½	“
Senna	1	“
Cream of tartar	1	“

Mix, and give a teaspoonful every night, or oftener if required.

Bathing and hygiene should be very carefully attended to.

WHOOPING-COUGH OR PERTUSSIS.

Treatment.—**1.** Begin with the following medicine as soon as the diagnosis is made:

℞.—Fluid extract of belladonna	10 drops
Alum	1 drachm
Simple syrup	4 ounces

Mix, and give a teaspoonful every three hours to a child two years old. The amount of belladonna in the prescription should be increased five drops for every added year of age in the patient.

2. Another good mixture is:

℞.—Clover hay	2 ounces
Boiling water	½ pint

Mix and let stand for half an hour, then strain and add 1 ounce of sugar. Give 2 teaspoonfuls every three hours.

INTESTINAL WORMS.

Treatment.—To drive out stomach worms give five and a half grains of santonate of soda on two succeeding nights; follow on the second morning with sufficient compound jalap powder to give a free purge. Give tonics afterward and keep the bowels regular.

Pin Worms.—Keep the bowels regular and the person clean, also take daily injections of cold salt water in the strength of a tablespoonful of salt to the pint of water.

Tape Worms.—**1.** For tape worms give the following:

℞.—Oil of turpentine	1 ounce
Castor oil	1 "
Honey	1 "
Yolks of 3 eggs.	

Beat the ingredients together and take it all, in divided doses during an hour, before retiring at night.

2. The ethereal oil of male fern is also an efficient remedy. The dose is from a half to one and a half drachms according to the age of the patient, given in milk or mucilage at night and followed in the morning by a purgative of compound jalap powder.

DYSENTERY.

Treatment.—Give the sulphate of magnesia in teaspoonful doses in as little water as will melt it every hour until the blood is stopped. Follow that by an astringent, or opium if there is pain. The subnitrate of bismuth will rapidly check the succeeding diarrhœa; give half a drachm every two hours until the bowels are checked. The patient should go without food for a day and then begin very cautiously with liquid diet and gradually increase until full diet is again reached.

INCONTINENCE OF URINE.

Treatment.—1. If it is due to irritating urine of too high acidity give alkaline drinks, skimmed milk and plenty of pure water. When it is due to nervous conditions give:

℞.—Belladonna	30 drops
Water	4 ounces

Mix and give a teaspoonful four times a day.

2. If the sufferer is a poorly nourished child give tonics like nux vomica or cantharides.

3. Sometimes circumcision will cure when all other means have failed.

MENTAL HEALING.

MESMERISM, HYPNOTISM, MIND CURE, CHRISTIAN SCIENCE, TELEPATHY.

No medical work is complete that deals only with drugs. Many theories of healing deal with the mind alone. The mind, which tells us of all our sufferings, is the path along which relief and recovery often travel.

Mesmerism.—This is a peculiar nervous condition in which the body and mind of an individual are supposed to be influenced by a mysterious force emanating from another person.

Hypnotism.—This is a condition artificially produced in which the person is apparently asleep and yet acts in obedience to the will of the operator as regards both motion and sensation.

Mind Cure.—This is the cure of disease by means of the mind alone.

Christian Science.—This teaches that those who really follow Jesus should follow Him in healing, which can be done through the mind.

Telepathy.—This is a power of mental vision or of mental hearing, or of a mental production of other sensations, by which the individual becomes aware of events happening in another part of the world from where he is, or can tell of the existence of objects which could not affect at any time any of his bodily senses.

HISTORY OF MENTAL HEALING.

It is natural that the apparent power of influencing the bodies and minds of others should attract much attention and be eagerly sought after for purposes of gain, or from a love of the wonderful and supernatural, or for the cure of diseases. So, while many have studied mental healing in a scientific spirit, more have done so as quacks and charlatans for the mere purpose of making money.

Modern Study of Mental Healing.—Recently, however, physicians and other scientists have set about investigating the subject and giving it much study and attention. The result has been that animal magnetism, as this power is sometimes called, has been put on a level with other sciences and has helped in relieving the sufferings of humanity.

Ancient Mental Healing.—In all ages there have been certain persons who could cure disease by a touch of the hand and who could communicate a healing virtue to the sufferer. Among the Chaldeans, the Babylonians, the Persians, the Hindus, the Egyptians, the Greeks and the Romans many of the priests effected cures or threw people into deep sleeps in the shades of the temples. During these sleeps the sleeper sometimes had prophetic dreams. Ofttimes they could produce effects like those now referred to animal magnetism.

Supernatural Influence.—Such influences were held to be supernatural, and they added greatly to the power of the priests. In the middle of the seventeenth century there appeared in England several persons who said they had the power of curing diseases by a stroke of the hand.

King's Evil Cure.—Valentine Greatrakes, in the County of Waterford, Ireland, attracted great attention by his power of curing the king's evil or scrofula. Thousands of sufferers crowded to him from all parts of the kingdom. About the middle of the eighteenth century John Joseph Gassner, a Roman Catholic priest in Swabia, claimed that the majority of diseases arose from demoniacal possession, and could only be cured by exorcism. He believed his power to be altogether supernatural and connected with religion.

MESMERISM.

The Name.—Mesmerism was named in honor of one of its early investigators. Friedrich Anton Mesmer was born at Weil, on the Rhine, on May 23, 1733. He studied medicine at Vienna, took his degree and commenced to practice.

Mesmer's Belief.—He was always very much interested in astrology, and he believed that the stars exerted an influence on beings living on the earth. At first he thought this supposed force was the same as electricity. Afterward he believed it to be identical with magnetism. From this he deduced the theory that stroking diseased bodies with magnets might bring about a cure. He published his first book in 1766. Ten years later, while in Switzerland, with Gassner, he observed that the priest effected cures by manipulation alone, without the use of magnets.

Cure by Touch.—This led Mesmer to discard the magnets and to try to cure without them. He found he could relieve suffering by the mere touch of his fingers. He therefore supposed that some kind of occult force resided in himself by which he could influence others. He held that this force permeated the universe and more especially effected the nervous systems of men.

Marvelous Cures.—In 1778 he moved to Paris, and in a short time the whole city was thrown into a state of great excitement by the marvelous effects of mesmerism. Mesmer made many converts.

Paris Inflamed.—Many controversies arose, however. The whole medical faculty of Paris rose in indignation and stigmatized him as a charlatan. But still the people crowded to him. He was offered 20,000 francs by the French Government for the disclosure of his secret, but he deliberately refused the offer. He received private rewards of large sums of money.

Mesmer's Office.—Everything about his office was enveloped in mystery. His consulting apartments were dimly lighted and hung with mirrors. All was quiet and still, save for the soft strains of music that occasionally were heard. All sorts of odors were wafted through the room.

Mesmeric Methods.—The patients sat around a kind of vat, in which various chemical ingredients were concocted or simmered over a fire. Holding each other's hands, or joined by cords, the patients sat in expectancy. Then Mesmer, clothed in the dress of a magician, glided amongst them, affecting one by a touch, another by a look, while he made passes with his hand at a third. The effects of this differed greatly, but all were benefited. Nervous ladies became hysterical or fainted. Some men were seized with convulsions and palpitation of the heart.

Franklin's Investigation.—The French Government appointed a commission of physicians and members of the Academy of Sciences to investigate these phenomena. Benjamin Franklin, the great American philosopher, diplomat and scientist, was a member of this commission. Franklin and his fellow commissioners drew up an elaborate report. They admitted many of the facts, but they contested Mesmer's theory that there was an agent called animal magnetism. They believed the effects were due to physiological causes.

Mesmer's Fate.—While Mesmer himself was honest in his belief, he had many imitators who brought the science into disrepute. They were a lot of imposters who fooled the people for the sake of gain. Even Mesmer himself was denounced as an imposter and a fraud. He finally had to leave Paris, and died at Meersburg in Switzerland, on 5th of March, 1815.

The New School of Mesmerism.—Mesmer left many disciples who investigated the subject in a scientific spirit. Chief among these was the Marquis de Puysegur. This nobleman revolutionized the art of mesmerism. He showed that many of the phenomena might be produced by gentle manipulation, causing sleep, and without the mysterious surroundings that Mesmer, himself, employed.

Spread of Mesmerism.—Since that time mesmerism has been studied by many. Each year more and more is known of it and greater use made of this knowledge. The power of mesmerism is no longer confined to France and Switzerland, nor is it exercised only by Mesmer and his followers. There is scarcely a town in this country that does not contain at least one inhabitant who can heal by the stroke of the hand. Few, indeed, are those who have not seen or heard of one possessing this peculiar power.

The Mesmeric Power.—All who exercise this influence do not have power in the same degree. Some, of course, are noted for their magnetism and travel from city to city curing hundreds by their touch. Many, however, are not known outside their native village, where their gentle stroking is eagerly sought for by those suffering from terrific headaches, which nothing else can relieve. Not a few possess this power in a small measure without recognizing it as mesmerism. Many a throbbing, fevered brow has been soothed by a gentle mother's hand. How often has the touch of magnetic fingers done more than all the medicines the doctor has ordered.

Mesmerism in the Household.—Those who find that they possess this soothing property of animal magnetism, in ever so slight a degree, should endeavor to cultivate and increase that power by proper exercise. When one discovers that a light touch of the hand will cause an electric thrill which seems to drive away pain and suffering, that person must try again and again and find what strokings will bring about the best results.

Electricity in the System.—Some are born with more electricity in their system than is possessed by the average mortal. This can be seen by combing one's hair in the dark, when bright sparks will fly. Often rubbing the ends of the fingers together will bring a spark large enough to light a gas burner. If this electricity or magnetism is developed in the proper channels it will make its possessor one of the most sought after of mortals.

Mesmerism in Disease.—There are many diseases that medicines cannot cure. Some to whom medicines give no relief, can be cured by the current from the electric battery. But many sufferers are turned away with the terrible verdict that nothing can be done for them. In not a few of these cases animal magnetism or mesmerism has effected a cure.

Mesmeric Cure of Headache.—In those cases of sick headache where drugs have only increased the agony, a few light touches of a magnetic hand have caused the pain to disappear, and sweet, refreshing sleep to take its place.

HYPNOTISM.

Name and Principle.—In the year 1841, a surgeon in Manchester, England, James Braid, began the study of what he called the pretentions of animal magnetism or mesmerism. He started without believing in it at all, calling himself "a complete skeptic" regarding all its phenomena. While investigating this subject he discovered that by a fixed and abstracted attention of the mind and sight on one object he could artificially produce a peculiar condition of the nervous system. To this condition he gave the name of neuro-hypnotism or nerve sleep; from the Greek *υεῦρον*, nerve and *υπηοζ*, sleep. Later the part neuro was dropped and the term hypnotism came into general use.

Hypnotism Explained.—At a meeting of the British Association in Manchester, on June 29, 1842, he read an essay on the cure of disease by hypnotism. In the following year his book came out, in which he reported a great number of cases in which he had successfully applied hypnotism in the relief and cure of disease.

Hypnotism a Science.—Since Braid started his investigation scientists in every country have studied the subject until now hypnotism is considered one of the national sciences.

Generally Taught.—In every college of the land hypnotism is taught and in every large city that art is practiced. It is not astonishing that this subject has caused such study among the scientists and has excited such wonder among all who have witnessed its workings.

Phenomena.—To think that by holding up a bright object or by waving a hand one person can put another so completely in his power that the victim not only acts but even thinks as the operator desires. If the operator tells his patient to walk across the room he is immediately obeyed. If he says there is a wild animal in the room the patient shrieks in terror at what he believes is a wild beast.

HOW HYPNOTISM IS PRODUCED.

Manner of Hypnotizing.—The usual method of inducing the hypnotic state is to cause the person operated on to stare fixedly at a bright object, such as a glittering piece of glass, or a polished watch charm, or the shining steel of a penknife. This object is held at from eight to fifteen inches from the eyes in such a position above the forehead as will strain the eyes and eyelids.

Effect on Eyes.—The operator may stand in front of, to one side of or behind the patient. As the patient strains to see an object so near it will be noticed that the pupils, the little round dots in the middle of everyone's eyes, are at first very small. You can see this whenever a person tries to look at a near object.

Enlargement of Pupils.—In a short time, however, the pupils will begin to grow larger. It is then that the operator makes a few passes over the face without touching it. The eyelids then close. Or the operator may gently close them with the tips of the fingers, at the same time very gently stroking the cheeks. Often a twitching of the eyelids may be observed when they are closed. The eyes may afterward become widely opened.

The Hypnotic State.—The patient is now in a sleep-like condition. The limbs often remain in almost any position in which the operator may place them. At the same time the patient may now be caused to make movements in obedience to the commands of the operator. He must also act according to the ideas suggested to him.

Hypnotic Illusions.—Thus, he may eat a raw potato with relish, apparently under the impression that it is an apple. He may make wry faces on drinking a glass of water when told that what he is taking is castor oil. He may ride on a chair or stool as in a horse race. He may fight with imaginary enemies or show tolerance of affection to imaginary friends. In short, all kinds of actions, even of a ridiculous and degrading character, may be done by the patient at the command of the operator.

Effects on Muscles.—Another class of phenomena consists in the production of stiffness or rigidity of certain muscles or groups of muscles, or even of the whole body. For example, on stroking the forearm it may be rigid while bent or stretched out. The knee may be strongly bent with the muscles stiff, hard and immovable. The muscles of the trunk may become as rigid as to allow the body to rest like a log with the head and heels on two chairs. In this position it is so stiff and rigid that it can bear the weight of the operator sitting upon it. The patient may be made to hear sounds that don't exist and to see colors and feel various sensations which exist only in the patient's mind.

Waking Up.—The patient may remain in this condition for an hour or more. He may then be roused by holding him for a few minutes and blowing gently into the eyes; sprinkling water, making upward passes or simply saying "wake up" are other methods employed for awakening.

After the State.—Usually the patient has a vague recollection, like that of a disturbed dream. Sometimes, however, the patient distinctly remembers all that has happened and even feels ashamed at having been compelled to do ridiculous actions.

Who May Be Hypnotized.—Certain persons are more readily hypnotized than others. It has also been observed that, once the condition has been successfully brought about, it can be more easily induced a second time, a third time more easily than a second, and so on. Finally the patient may be so under the will of the operator that a fixed look, or a wave of the hand, may throw him at once into the condition. M. Liégeois has hypnotized some of his subjects by telephone. Children under three or four, on the other hand, and insane persons, especially idiots, are unusually hard to hypnotize.

THE SYMPTOMS OF THE TRANCE.

Loss of Memory.—In the earlier stages of hypnotism the patient remembers what has happened, but with successive sittings he sinks into a deeper condition, which is commonly followed by complete loss of memory. On waking he can recall nothing at all.

Return of Memory.—But just as we may be reminded of a dream by meeting persons or objects that figured therein, so on being prompted the hypnotic subject will often remember what happened in his trance. One can often make them remember by merely telling them during the trance that they shall remember.

Suggestibility.—The patient believes everything his hypnotizer tells him and does everything the latter commands. The patient may do things over which the will has normally no control. He will redden, turn pale, sneeze, become hot or cold, and so forth.

Effects on Motion.—Tell the patient that he cannot open his eyes or mouth, cannot unclasp his hands or lower his raised arm, and he will be immediately powerless to do so. Say his arm is paralyzed and it will fall limp at his side.

Hallucinations and Delusions.—You can make your subject think he is freezing or burning, itching or covered with dirt, or wet. He can be made to drink a cup of vinegar for a glass of champagne and may become drunk in consequence. A chair will be a lion, a broomstick a beautiful woman. The subject can be made to believe that his personality is changed into that of a baby, of a street boy or of Napoleon. He may even be transformed into a beast or an inanimate thing like a chair or a carpet.

Sensation Abolished.—Legs and breasts may be amputated, children born, teeth extracted and the most dangerous operations undergone without the patient feeling any pain. In the same way neuralgias, toothaches and headaches may be cured. In one case the sensation of hunger was abolished and the patient took no nourishment for fourteen days. A subject may be made blind to a certain person, and to everything pertaining to him. What he says is not heard and his contact is not felt.

Acuteness of the Senses.—The sense of touch is so delicate that a subject after simply poising on her finger tips a blank card drawn from a pack of similar ones can pick it out from the pack by its weight. A coin from the operator's pocket has been repeatedly picked out by the subject from a heap of twenty others by its greater weight. A subject may be made to hear a watch tick or his operator speak in a distant room.

Changes in the Tissues.—In certain subjects a congestion, a burn, a blister, a pimple or a bleeding from the nose or skin may be caused by a mere suggestion.

After-Hypnotic Suggestions.—These are given to the patient, during the trance to take effect after waking. They succeed with a certain number of patients even though the act is to be performed months or even a year after the command is given. In this way one can make the patient feel a pain or be paralyzed, or be hungry or thirsty, or do something ridiculous after coming out of his trance. In these cases he forgets that the suggestion was given him in a previous trance. He thinks he is acting of his own free will.

MIND-CURE.

The Mind and Disease.—It is well known that the mind has a great influence on matter. Physical changes have been wrought by mental states. Diseases have been caused and have been cured by the influence of the mind. Many instances can be quoted illustrating this fact. Persons have been shot dead with blank cartridges. An Edinburgh criminal died from a supposed loss of blood when it was only warm water that was made to trickle over his arm after it was badly pricked by the surgeons.

A Case in Point.—Dr. Moore mentions the case of a lady who died with every symptom of hydrophobia under the mistaken notion that she had been bitten by a rabid dog when it was demonstrable that the animal had only torn her dress.

Another Illustration.—One of the most instructive and satisfactory experiments on record showing the influence of the mind in the generation of fatal diseases is that tried upon four Russian criminals who had been condemned to death for political offenses. The cholera was raging at the time in Russia and the criminals, while ignorant of the fact, were made to occupy beds on which patients had recently died with the disease. Although thus exposed to the contagion not one of them exhibited the least symptom of the malady.

The Second Experiment.—After this they were told that they must sleep on beds that had been occupied by persons who had been sick with the cholera. But in fact the beds were entirely new and had never been used by anyone. Their fear proved to be a more powerful influence than the contagion, for three out of the four took the disease in its most fatal form and died in four hours after the attack.

Effect of Faith.—The influence of faith in the cure of disease is well illustrated by a fact mentioned in Paris's Life of Sir Humphrey Davy. In the early period of his scientific career, Davy was assisting Dr. Beddoes in his experiments on the inhalation of nitrous oxide. Dr. Beddoes thinking the oxide must be a specific for paralysis a patient was selected for trial and placed under the care of Sir Humphrey. Before administering the gas, wishing to ascertain the temperature of the palsied man's blood, a small thermometer was inserted under his tongue. The paralytic, wholly ignorant of the process to which he was to be subjected, but deeply impressed by Dr. Beddoes with the certainty of its success, no sooner felt the thermometer between his teeth than he concluded that the talismanic influence was at work, and in a burst of enthusiasm declared he felt its healing power through his whole body.

Carrying on the Experiment.—Here was an opportunity to test the influence of the mind in the cure of palsy that was not to be lost. The gas was not used, but on the following day the thermometer was again employed with equally marked effects, and at the end of two weeks the patient was discharged cured, no remedy of any kind having ever been used except the thermometer. His faith made him whole, not by accident, nor by a miracle, but by an invariable law of our being.

The Power of Faith.—Faith is a spiritual force that has accomplished wonders. It is an actual psychological or spiritual force. To believe that we can do a thing, especially if that faith is the result of an understanding of nature's laws, empowers us to do it. To believe that we are well, or that we are becoming so, excites a spiritual force within us, that goes far toward making us so.

Faith in Remedies.—If we firmly believe that a certain remedy will cure us of a diseased condition, though it has no chemical adaptation to the removal of the disorder, we shall be benefited by it. Disease has often been cured by faith alone in the patients.

The Bible Instance.—The familiar case of the woman mentioned in the Gospel history, who had suffered for twelve years from a dangerous uterine hemorrhage, baffling the skill of various physicians, is known to all.

Requisites in Mind-Cure.—There are two things in a patient necessary to the mind cure. One is a desire to get well. The other is a faith in the efficiency of the remedial agency.

How Mind-Cure Acts.—Through the grand system of sympathetic nerves each organ in the body is connected with every other, and the whole with the mind. There is no part or function which cannot be affected just as certainly, though perhaps not so sensibly, by the will-force, as the muscles of the arm.

The Nerve Conductor.—The pneumo-gastric nerve, according to Evans, which is distributed to all the organs within the cavity of the trunk, is the appointed conductor through which the mental force is communicated to them and influences their action. We have only to concentrate the mind's force upon any of the internal organs, as the stomach, liver or intestinal canal, and through the pneumo-gastric nerve its workings will be influenced.

Mind Cure in Indigestion.—If the stomach has become exhausted of its nerve force so that it fails to do its work and the food in it is a motionless and fermenting mass, according to Evans, it can be made to obey the command of the sovereign mind. Concentrating the mind upon it, bring our spiritual force to a focus, we may calmly and powerfully will it to proceed to business and attend to its proper work, and it will obey us as readily and as promptly as a good servant yields to the orders of his employer. The same effect may be produced upon the action of the intestinal canal.

Mind-Cure for Cold Extremities.—Mental-curists claim that if the blood and vital head do not circulate through the extremities, which feel a deadly coldness, it is because the spiritual life does not permeate the tissues. We may send the spiritual principle there, by the will force, to distribute to the negative parts their share of the vital flame.

Every Man His Own Physician.—A little practice, according to Evan, will render the mind-cure easy and natural, and we can become our own physician and healer without the use of actual medicine.

TELEPATHY.

Mind-Sight.—We know that the somnambulist or sleep walker, in the darkness of the night, with his eyes closed, can climb dizzy heights and walk along dangerous precipices with ease and apparent safety. This power thus exhibited, according to Prof. Barnes, is evidence that there is a medium adapted to the sight of the mind which enables it to see things beyond the sense of ordinary sight. Many instances have occurred where persons in a natural state have discovered that they possess the power to divine the thought of others.

Division of Telepathy.—Telepathy or clairvoyance may be considered under two heads, namely, sympathetic and independent.

Sympathetic Telepathy.—A sympathetic clairvoyant takes on the feelings of the one with whom he is in sympathy. He very often feels, sees, hears, tastes and smells that which the other party does.

Telepathy in Disease.—He is sometimes able to locate pain and disease immediately through this wonderful faculty. Barnes gives the following examples of sympathetic telepathy: "I blindfolded a gentleman, placed my hands in contact with his, while the third party pricked me at various points with a sharp instrument. The subject would feel the pain immediately at the point upon his own body corresponding to the exact location where the instrument was being used upon me. . .

"I know a dentist in Western New York who is so sympathetic that he suffers whenever his wife does. He has the same feelings and never improves until she begins to recover. A pupil of mine, a contractor, who is exceptionally strong, told me that the above condition existed between himself and wife, and that the distance made no difference, as he was hundreds and sometimes thousands of miles away from home."

Independent Telepathy.—Independent clairvoyants are able to get information independently of any sympathetic relation, apparently. They are able to separate the soul from the body, as it were, and to travel to foreign countries. Time and distance seem to cut no figure with them. Prof. Barnes recites many startling instances of this kind of telepathy.

Practical Application of Telepathy.—The usefulness of telepathy lies in the knowledge of its practical application. Understood and applied, it is a most valuable and valued instrument in the hands of the learned physician or in any of the walks of life.

CHRISTIAN SCIENCE.

Mortal and Divine Mind.—In Christian Science a great distinction is drawn between mortal mind and the Divine mind. Mortal mind is part of our material being, it belongs to matter, and it gives us our feelings of pain, sickness, error and sin. The Divine mind is spiritual. It is part of that Divine Spirit that fills the universe. It is God. Inasmuch as the Divine mind is God and fills the universe. it is good and truth. There can be no sin or sickness in divinity.

Nature of Sickness.—Sickness is merely a false impression conveyed by erring mortal mind. The way to cure both sin and sickness is by substituting the Divine mind for mortal mind. This can be accomplished by a proper realization of the Scriptures in their true meaning, according to Christian Science, until the seeker after truth separates the material from the spiritual, and thereafter is ruled by Divine mind.

Principles of Christian Science.—The fundamental propositions of Christian Science as laid down by Mrs. Eddy in book "Science and Health," are summarized in the four following, to me, self-evident propositions. Even if read backward, these propositions will be found to agree in statement and proof.

1. God is all.
2. God is good. Good is mind.
3. God, Spirit, being all, nothing is matter.
4. Life, God, omnipotent good, deny death, evil, sin, disease.

Disease, sin, evil, death, deny good, omnipotent God, life.

The evidence of the physical senses often reverses the real science of being and so creates a reign of discord, assigning seeming power to sin, sickness and death; but the great facts of life, rightly understood, defeat this trend of errors, contradict their false witnesses and reveal the Kingdom of Heaven, the actual reign of harmony on earth. The material senses' reversal of the science of soul was practically exposed by the demonstrations of Jesus nineteen hundred years ago, yet this so-called sense still makes mortal mind tributary to mortal body, and ordains certain sections of matter, such as brain and nerves, as the seats of pain and pleasure, whence matter reports to this mind its status of happiness or misery.

Revelation of Christian Science.—The revelation of Christian Science consists of two parts:

1. The rediscovery of the Divine science of mind-healing, through a spiritual sense of the Scriptures and through the teachings of the Comforter, as promised by the Master.

2. The proof, by present demonstration, that the so-called miracles of Jesus did not specially belong to a dispensation now ended, but that they illustrate an ever-operative Divine principle.

Prayer and Healing.—"The prayer of faith shall save the sick," says the Scripture. What is this healing prayer? A mere request that God will heal the sick has no power to gain more of the Divine presence than is always at hand. The only beneficial effect of such prayer for the sick is on the human mind, making it all more powerfully on the body through a blind faith in God.

Right Prayer.—In order to pray aright we must enter into the closet and shut the door. We must close the lips and silence the material senses. In the quiet sanctuary of earnest longings we must deny sin and plead God's allness. We must resolve to take up the cross and go forth with honest hearts to work and watch for wisdom, truth and love. We must "pray without ceasing." Such prayer is answered, inasmuch as we put our desires into practice. The Master's injunction is that we pray in secret and let our lives attest our sincerity.

Method of Treatment.—Mrs. Eddy advises the following mode of treatment:

"Always begin your treatment by allaying the fear of patients. Silently reassure the patient as to his exemption from disease and danger. Watch the result of this simple rule of Christian Science and you will find that it alleviates the symptoms of every disease. If you succeed in wholly removing the fear your patient is healed."

Winning the Battle.—The great fact that God wisely governs all, never punishing aught but sin, is your standpoint, whence to advance and destroy the human fear of sickness. Plead the cause for science and in truth, mentally and silently. You may vary the arguments to meet the peculiar or general symptoms of the case you treat; but be thoroughly persuaded in your own mind and you will finally be the winner.

THE MASSAGE TREATMENT OF DISEASE.

GENERAL DESCRIPTION.

Definition of Massage.—Massage is a method of treating abnormal conditions by various manipulations of the more accessible structures of the body. Its object is to stimulate to greater activity the contents of the cells of such tissues as are susceptible to the effect of kneading, rubbing, rolling, pinching, slapping, stretching, etc.

Swedish Movements.—With massage it is quite usual to combine Swedish movements, a system in which motions of a rhythmical character, both active and passive, are employed. To facilitate the execution of the manœuvres of both these methods of treatment mechanical contrivances are often used. While not strictly accurate, it is customary to include all the manipulations of both these systems under the general term "massage."

Effects of Massage.—The effect of these manipulations is to promote nutrition, either general or local, to relieve congestion, to aid in the removal of waste products and in the absorption of effusions and abnormal deposits. In the main their influence is felt in the lymphatic and circulatory systems, in the cutaneous, muscular and nervous structures, upon the digestive and nutritive functions, and upon certain of the internal organs.

By alternate contraction and relaxation of the muscles they are exercised as fully as possible without exhaustion, and the blood is propelled with greater activity, thus permitting its life-giving qualities to reanimate and restore the vitiated and worn-out tissues. Respiration and secretion are likewise increased, and the peristaltic movements of the intestines promoted. Probably from a reflex effort on the nerves of sensation it often gives relief from pain. A rise of temperature usually accompanies a treatment by general massage, and where the massage is confined to a limited area a local rise of a number of degrees may occur.

METHODS OF MASSAGE.

Any knowledge of the technical details of massage which can be gained from text-books or lectures must necessarily be superficial and theoretical, for the manual dexterity essential for its proper application requires long and continued practice on the human body to acquire the art.

For its intelligent execution a fair knowledge of anatomy and physiology should first be secured.

Forms and Movements.—When the hands of the operator only are employed for massage, the process is termed immediate; when mechanical appliances are used it is termed mediate. The main movements employed in either form are stroking, friction, kneading and percussion, with their modifications. In immediate massage the palms of the hands, the tips of the fingers and the balls of the thumbs are principally, though not exclusively, employed, and the action is a free one from the wrist.

The movements should be smooth and even, and, until the patient becomes accustomed to the treatment, gentle and not too rapid. The degree of firmness and rapidity is regulated by the rigidity of the muscles, the amount of adipose tissue, the part treated, the sensitiveness present and the general nervous irritability of the patient, and may be increased with the duration of the treatment.

In Cases of Obesity.—It may even be necessary in cases of obesity to supplement the action of one hand by pressure from the other. In general massage the extremities should be treated first, the motion being in the direction of the long axis of the bone and extending from the distal end toward the trunk. Each group of muscles is systematically treated, one area being treated before a new one is selected.

Stroking.—1st. In stroking, the palm of the hand or the radial border is used over large areas of surface, or the pulps of the fingers or sides of the knuckles over smaller surfaces.

Friction.—2d. In friction, the tips of the fingers or the full hand is employed over small areas by a circular rubbing.

Kneading.—3d. In kneading, a muscle or group of muscles is subjected to pressure by the hand or hands sufficient to cause the skin to move over the subjacent tissues, the thumb and fingers being well separated and a slightly rotary motion being used. In some portions of the body the tips of the fingers and the backs of the thumb tips are employed.

Fulling.—In which the muscles of the extremities are rolled rapidly back and forth, between the extended palms of the hands, transversely to the long axis of the bone; vibrations in which very rapid pressures and relaxations are employed, and pressure by the knuckles or tips of the fingers, are all modifications of kneading.

Percussion.—4th. This consists of successive blows of varying intensity and delivered by different portions of the hand, according to the part of the body treated.

Position and Rest.—In treating by general massage the patient should be recumbent, with the position relaxed, breathing quietly and regularly. After treatment a period of rest of at least half an hour should be observed. In abdominal and cervical massage the same relaxation should be regarded.

The duration of a single treatment should be from forty to sixty minutes for general massage, or a shorter time for local treatment. The rapidity of the manipulations varies from seventy to two hundred per minute, depending on the method employed and the effect desired.

APPLICATION TO DISEASED CONDITIONS.

Massage a Safe Resource.—"It may be said, in a general way, that whenever we desire to modify profoundly the processes of nutrition; to remove effete material from the system; to stimulate assimilation and invigorate digestion; to soothe nervous irritability and relieve nerve pain; to arouse dormant nerve force; to remove morbid deposits from, and from the neighborhood of, inflamed joints, and thus restore their normal mobility; to equalize the circulation, drawing blood from the hot head, congested abdominal viscera or laboring heart, and accelerating its passage through the cold extremities—we may find a safe resource in this system."—Dr. Benjamin Lee, "Hare's System of Practical Therapeutics," Vol. I, page 291.

The wide field of its applicability is thus suggested. Attention is now called to the individual diseases in which it may be usefully employed. Among these may be first mentioned those of the alimentary tract.

Diseases of the Stomach.—In atonic dyspepsia, and in chronic gastric catarrh, accompanied by dilatation of the stomach, in both of which there is a relaxed condition of the muscular fibres, it is often of benefit. Contractions of the stomach are stimulated, the food is forced onward, the nutrition of the organ is improved, the flow of gastric juice is promoted, flatulence is relieved, and pain and distress, either from this cause or when of nervous origin, is alleviated. From two to five hours should elapse after a meal before the treatment is given, and this should last ten or fifteen minutes.

The Proper Movement.—Dr. D. D. Stewart, in "Hare's System of Practical Therapeutics," Vol. II, page 965, thus describes the technique of massage in these cases: "The massage movements, both stroking and kneading, should be from the fundus and cardia toward the pylorus, gentle and superficial at first, and after a few minutes' manipulation more energetic. The patient should be supine, with abdomen relaxed. At the termination of each treatment the massage should be extended to massage of the abdominal muscles."

Massage in Nervous Dyspepsia.—Lauder Brunton, in the Lettsomian Lectures on "Disorders of Digestion," speaks in glowing terms of the usefulness of massage with forced feeding in nervous dyspepsia, citing the case of a man who from this cause became progressively emaciated during two years to the last degree, and in whom medicines employed by the most eminent physicians had failed to benefit, and who by the treatment referred to was restored to robust health in the course of eight weeks. Such a result is nothing less than marvelous, and while the case may be regarded as phenomenal, it serves to illustrate how marked may be the benefit following the treatment in this class of cases.

Diseases of the Intestine.—Constipation.—One of the most useful fields for the application of massage is in the treatment of chronic constipation, a condition as difficult to radically cure as it is common in occurrence, and which is attended by a train of evils formidable in their effects. It is frequent to see benefit follow simple rubbing of the abdominal walls of children by mothers for the relief of this condition, but the more scientific employment of massage is of still greater value. The course of the colon is generally followed, beginning low down on the right side, moving upward, across to the left side and downward, and repeating these movements in a sort of rotary fashion. Their effect is largely mechanical in aiding onward the contents of the intestinal canal. A cannon ball weighing from four to six pounds and rolled around the abdomen in this direction is a method of mediate massage which may be used as a substitute for the manual form.

Abdominal Uses.—Aside from the mechanical effects produced, however, there are others much more important which may be achieved by the intelligent use of massage. Relaxed conditions of the abdominal muscles and of the muscular layer of the bowel may be overcome, peristaltic movements stimulated, secretions increased and the nutrition and general nerve tone of the tract improved. Hans Leber, directing physician of the Hydriatic Institute of Homberg, Germany, in an article on the treatment of constipation in vogue at that place, which appeared in the "International Medical Magazine," of November, 1898, discountenances the employment of massage for its purely mechanical effects, and advocates strongly the adoption of only those manipulations which will result in "strengthening the intestinal muscles, stimulating peristalsis, reducing the chronic inflammatory condition of the intestinal mucous membrane and removing the adherent tough coating of mucus."

Kneading Process.—Bueler, quoted by Lee in "Hare's System of Practical Therapeutics," emphasizes the importance of discrimination in the selection of the form of massage best adapted to the case in hand, and shows that kneading breaks up fecal accumulations, stroking aids in the excretion of materials loosened by these manipulations, while percussion of the abdominal walls stimulates a reflex contraction of the involuntary muscular layer of the intestine.

Massage Advocated.—In the "Journal of the American Medical Association," May 26th, 1900, Dr. Charles E. Stewart, of Battle Creek, Michigan, writes on chronic constipation as a symptom resulting from a disordered condition of that portion of the nervous system which presides over the alimentary canal, and advocates massage as a valuable adjunct to other treatment, describing as useful the employment of a mechanical device for abdominal kneading, which consists of a table with a large aperture near the centre of the top. In this opening plays a series of six vertically-placed bars. Each bar is separately connected with an eccentric, to give it an independence of motion. When in motion these bars have an undulatory movement. The top of the table is so constructed that with each vertical movement of the bars it moves back and forth, thus bringing the entire abdomen in contact with the kneading bars.

MASSAGE IN SPECIAL DISEASES.

Diarrhœa.—In those cases of acute diarrhœa, which are the result of an accumulation of masses of hardened material, which serves to irritate the intestinal canal, massage aids in disintegrating and dislodging them. In chronic diarrhœa, where there is relaxation of the tissues, properly regulated percussion and vibration will serve to stimulate the parts to a healthier condition.

Hernia or Rupture.—This is a suitable case for the exercise of careful massage, but it requires the most skillful and patient handling by trained operators to avoid damage and to procure good results.

Congestion of the Liver.—This, together with catarrh of the bile duct, is relieved by massage of the abdomen, and by direct massage of the liver, the circulation being thus stimulated. The flow of bile is increased both by the mechanical effect of pressure on the duct and by stimulating the secretory function.

Gall Stones.—Manipulation of the gall bladder and duct has proved peculiarly efficaceous in the treatment of gall stones, and where these are impacted in the gall duct properly conducted massage will often dislodge them, and give speedy and absolute relief.

Valvular Diseases of the Heart.—In valvular diseases of the heart massage may be advantageously employed to decrease the vascular pressure, and thus to relieve the laboring organ.

Dropsy.—Effusions of serum, whether abdominal or in the extremities, is a condition amenable to treatment by massage. Its reabsorption is effected by manipulation of the abdomen and liver, and its excretion by percussion and strong stroking over the kidneys. Moreover, by increasing the tone of the capillaries, a diminution in the amount of watery secretion occurs. Dropsy, the result of pressure from abdominal tumors, may often be relieved by massage.

Varicose Veins.—As an adjunct to other agencies in the treatment of this disorder massage by upward strokings and carefully applied kneadings is useful.

Neuralgia.—From its effect in improving nutrition and the general tone of the system, many cases of nerve pain are relieved by massage. Aside from this, however, treatment of neuralgias by local massage, especially when the superficial nerves are involved, is often of marked benefit. Sciatica is one form in which it has been particularly efficacious.

Headache.—Headaches, whether of a neuralgic character, or dependent on a determination of blood to the brain, are suitable cases for this treatment. In the former the forehead is gently stroked or the scalp rubbed more briskly; in the latter the congested condition is relieved by massage of the neck, downward stroking, using the ulnar border and palmar surface of the hands, the movements extending from the angle of the jaw to the collar bone.

Nervous Prostration.—In this condition, to an extent seen in few, if any others, is the marked benefit of massage shown. The improved digestion, the bettered condition of circulation and general nutrition, the heightened nerve and vascular tone are results which go far toward restoring to a normal state the patient who is suffering from this complex trouble. In the large majority of cases this can be effected by the use of massage, especially when used in conjunction with enforced rest, systematic feeding, and the other agencies employed in what has been brought more particularly to the notice of the profession by Dr. S. Weir Mitchell, under the name of the "Rest Cure."

Paralytic Affections.—In infantile paralysis improvement and often cure will be the result of the systematic use of massage, persisted in for weeks or months, even though a considerable time may have elapsed during which nothing apparently has been achieved. In pseudo-hypertrophic muscular paralysis, in acute muscular atrophy, in posterior spinal sclerosis (locomotor ataxia), and in the paralysis following diphtheria and other infectious diseases it is also often curative. In locomotor ataxia deep massage of the muscles of the back aids in relieving the paroxysms of pain which are so frequently an accompaniment of this disease in its earlier stages, and helps to establish a better circulation. Later on, after muscular movements are wholly or in large measure suspended, the use of general massage to promote nutrition is of service.

St. Vitus' Dance.—Truly remarkable results are sometimes accomplished in this disease by massage. At first light strokings and friction are used over limited areas, these are gradually increased in extent, in frequency and in degree of pressure, and subsequently are followed by systematic movements of the extremities and by light gymnastic exercises.

Writer's Cramp.—This and the allied affections occurring in overused muscles among piano players, violin players, telegraphers, knitters, blacksmiths and others whose occupation requires the constant employment of certain groups of muscles are all improved by massage treatment.

Mental Affections.—In mental depression, melancholia and in those forms of insanity which are not characterized by active delirium and excitement, massage and passive exercise are useful.

Muscular Rheumatism, in such form as occurs in lumbago, wry neck, and so forth, is curable by circular kneading and stroking.

Stiff Joints, following rheumatism and gouty affections, and effusions in and around the joints, are often remarkably benefited by massage.

In these cases the treatment should be begun above the joint and gradually extended to it, and should consist of friction and upward stroking and of the kneading of the tissues.

Sprains.—Gentle massage, even in the acute stage of sprains, is followed by the most gratifying results. Pain is relieved, swelling is reduced and the duration of the trouble is much less than by the ordinary methods of treatment by rest and fixation. If masséed by a skilled operator from the beginning of the injury, two or three times daily, only about one-fourth of the usual time is occupied in effecting a cure.

Curvature of the Spine.—Certain cases of spinal curvature not dependent on mechanical causes are amenable to treatment by exercise and massage of special muscles.

Congestion of the Lungs.—In this trouble, especially when chronic in character, benefit may be expected by massage.

Consumption.—It is more especially, however, in consumption, where it is applied vigorously and persistently, and is to be judged from its effect in toning and invigorating the system and in improving nutrition that its gain is most apparent.

Croup.—The spasmodic condition present in ordinary or false croup is relieved by massage, and the membrane dislodged and congestion relieved in true croup by its use.

Pleurisy with Effusion.—In this affection the intercostal muscles on the side of the lung involved are firmly masséed several times a day, absorption of the fluid being thereby stimulated.

Diseases of Women.—This form of treatment is applicable to the relief of some of the diseases peculiar to women, among them ovarian and uterine congestion and ovarian dropsy. In the latter condition greater benefit sometimes results than from tapping, though of course a radical cure cannot be effected.

Miscellaneous Diseases.—Obesity which is probably due to faulty nutrition, stone in the kidney, congestion of the brain and certain diseases of the eye and of the skin are also among the complaints in which massage is sometimes usefully employed.

ELECTRICITY IN MEDICINE.

Introduction.—For half a century there has been a steady growth in the use of electricity as a medical agent. At this date many institutions are organized for the purpose of applying electrical treatment to various diseases and medical-healing is taught in nearly all the medical colleges.

Application.—At first electricity was thought to be useful for only that class of diseases due to the nerves and it was generally applied by means of the galvanic battery, which was made in various forms for home use. But the treatment has grown to embrace a variety of diseases.

Dyspepsia.—Electricity is found to be an excellent treatment for dyspepsia on account of the relief it affords to both the physical and mental conditions that accompany the disease. It gives tone to the appetite, cures sleeplessness, removes distress after eating, strengthening the powers of digestion and drives away despondency and gloom.

Fits, Epilepsy, Falling Sickness.—These diseases being nervous in character yield satisfactorily to the electric treatment. Any nervous disease is more readily reached by electricity than by other remedies and some remarkable cures have been placed to its credit.

Anemia.—This means want of blood and the patient becomes pale and weak. The disease is a general condition, and as a cure electricity is found efficacious. It stimulates the same as oxygen, produces more red corpuscles in the blood, imparts increased vital energy to the blood currents and does away with languidness and depression.

Consumption.—When this disease is traceable to catarrhal inflammations, faulty secretions and impaired nutrition, electricity is found beneficial as a purifier of the blood, a quickener of circulation and a preventive of the tuberculous deposits in the lungs. It is even claimed that by its stimulating effects on nutritive functions it builds up that part of the system which has gone to decay.

Catarrh.—Those skilled in electric-healing claim that electricity is almost a specific for the cure of this disease and they have placed many cures to its credit. The grip and hay-fever, being catarrhal in their nature, are also treated effectively by electricity.

Nervous Debility.—This is produced by a constant drain upon the nervous forces and fluids of the system. Its symptoms are loss of memory, dimness of sight, constipation, gloominess, impoverished blood, and so forth. The modern electro-therapeutic treatment is applied with great success in this distressing disease and many permanent cures are claimed.

Neuralgia.—This painful nervous disease yields to but few treatments, but it is claimed that the electric treatment can be relied on in all cases, acute or chronic, to give almost instant relief and effect a cure.

Sciatica.—This is only another form of neuralgia and is also amenable to treatment by electricity.

Rheumatism.—In modern electro-therapeutics it is found that rheumatism yields readily to the electric treatment, the claim being that the disease is due to a storing of waste material in the body which can only be removed through the circulation, a process which electricity effects when skillfully applied.

Diabetes.—In this terrible and baffling disease the electrical treatment has been found efficacious, not only arresting the disease but producing cures. The claim is that it stimulates the system and so fortifies nature that the disease is finally overcome.

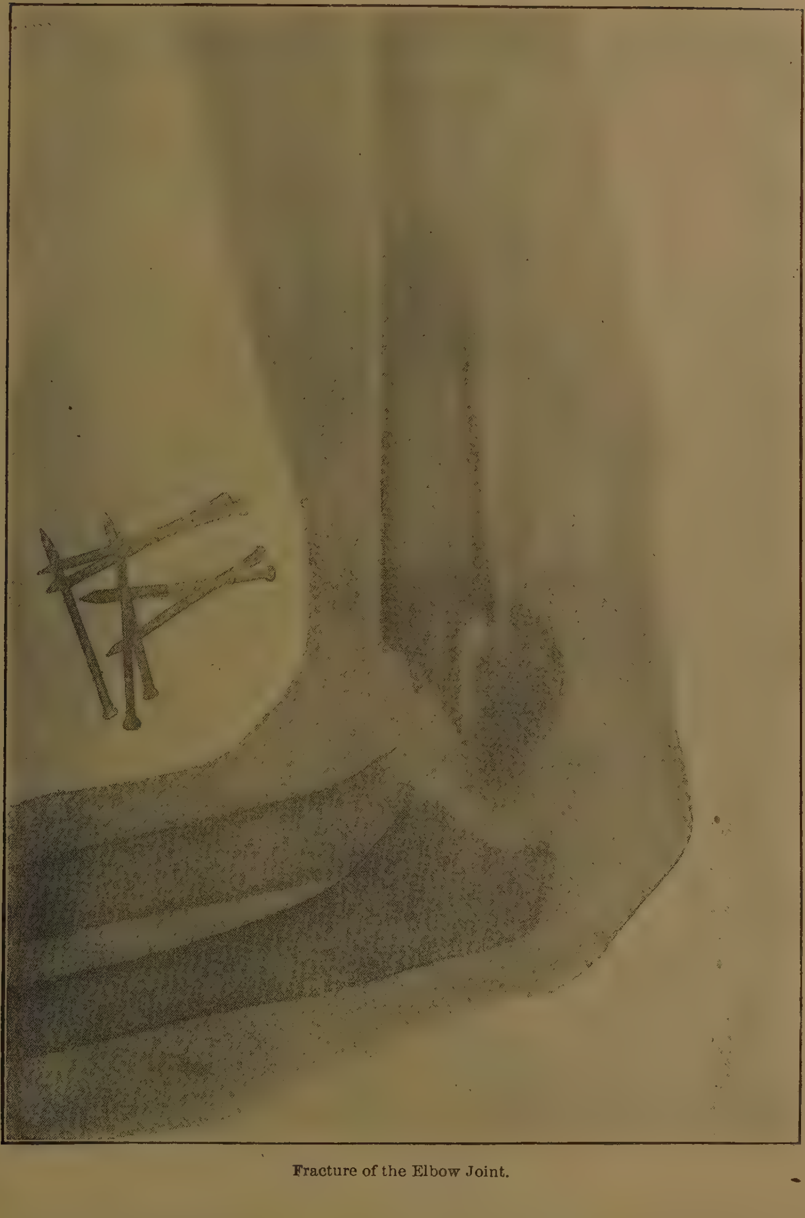
Kidney Diseases.—In diseases of the urinary tract producing weakness of the organs, extreme nervousness, milky or cloudy urine, pain in the back, frequent, scanty or painful urination, the electric treatment is found to have a powerful tonic effect on the organs, enabling them to reassert their functions and in the end eradicate disease.

Paralysis or Palsy.—This disease, due to an overworked or debilitated nervous system, is amenable to the electric treatment, and it has been found that such treatment is about the most effective that can be used.

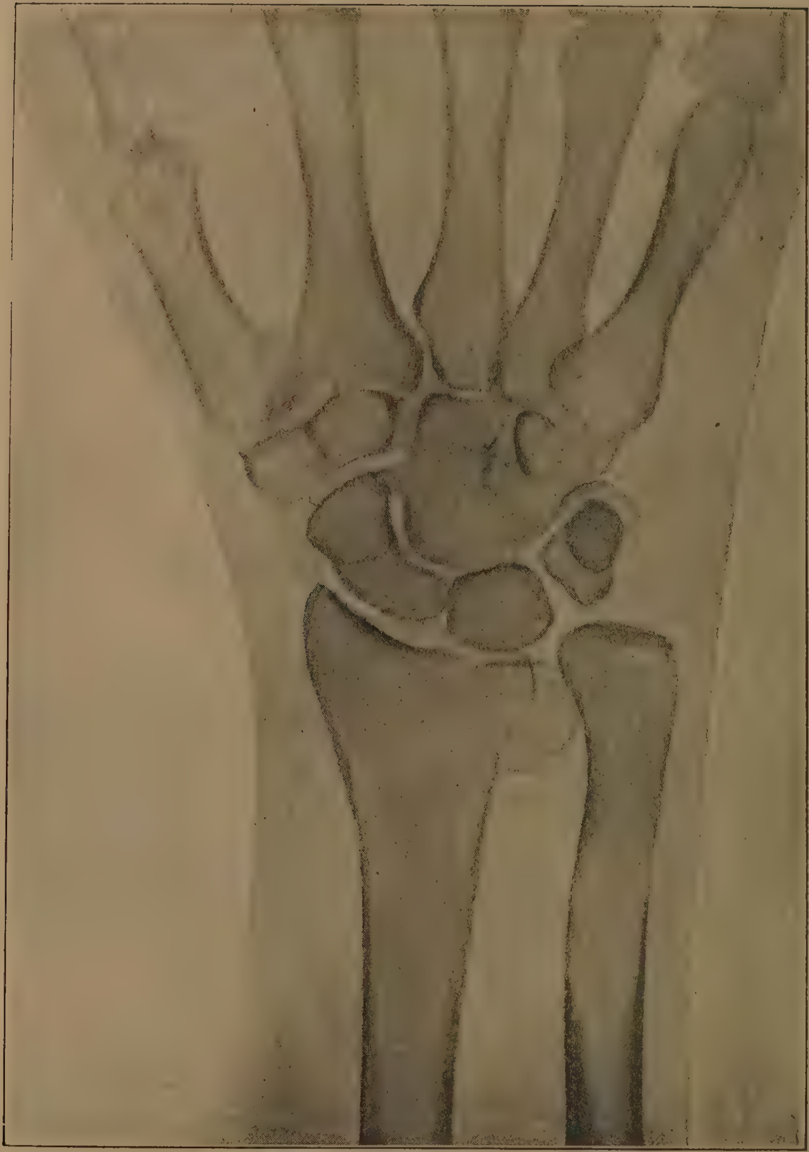
Conclusions.—It will be seen that while many of the diseases curable by electricity are outside of the strictly nervous class, yet all are more or less associated with that class, so that after all, the merits of the electric treatment may be said to rest largely on its stimulus to and power over the nervous system.

THE X-RAY.

An astounding electrical revelation came during the last years of the nineteenth century through the discovery of the X, or unknown, or Roentgen, rays. In 1894, Hertz showed that the cathode rays of the Geissler tubes would penetrate thin sheets of metal placed within the tubes. Subsequently Paul Lenard showed that the cathodic ray could be investigated as well outside of the tube as within it, and secured some photographic effects. Professor Roentgen took up the subject, and, in 1896, fairly set the scientific world aflame with the announcement that the cathodic, or X, ray would not only penetrate solid substances, but deposit solid substances within or behind those other substances. He invented a photographic instrument to take advantage of his discovery,



Fracture of the Elbow Joint.



Calb's Fracture, with Fracture of Styloid Process of the Ulna, or Bone of Forearm.

and by means of it, electricity was turned to the account of photography, pictures being possible of the interior of the human body, and of any foreign substance therein.

The discovery and application of the X-ray has proved of immense value to medicine and surgery. By its means the physician is enabled to carry on far-reaching diagnoses, and to ascertain with certainty the whole internal structure of the human body. Fractures, dislocations, deformities and diseases of the bones may be located, and their character and treatment decided upon. In dentistry the teeth may be photographed by means of the X-ray, even before they come to the surface, and broken fangs and hidden fillings may be located. Foreign objects in the body, as bullets, needles, calculi in the bladder, etc., may be located, and the surgery for their safe removal greatly simplified. The beating of the heart, movement of the ribs in respiration, and outline of the liver and other organs may be exhibited to the eye. It has even been suggested that the X-ray may become an agency for destroying the bacilli which produces disease in the human body. Verily the X-ray opens the field for the grandest of electrical possibilities.

THE PASSIONS.

THEIR INFLUENCE ON HEALTH.

There is no more interesting study than that of the passions. Of nothing do we think we know so much while in reality we know so little.

We love, we fear, we hate. We experience every passion and emotion. But have we ever stopped to think what are these passions that we are feeling every day?

THE INFLUENCE OF THE MIND ON THE BODY.

We not only feel our passions, we act them. Every emotion has its outward manifestation.

A muscle may become stiff or lie limp. Our blood-vessels may constrict and make us pale or they may dilate and make us redden. The heart often beats more quickly or more slowly, and sometimes even stops for a time. Our breathing may be short and quick or long drawn out with great pauses. The glands in the mouth may stop secreting and our mouth and throat become dry. The glands in the eye may secrete too much and the tears run down our cheeks.

Different Manifestations in Different People.—The passions often act differently upon different people. Every one of us, almost, has some peculiarity of expression. One person will laugh or act differently from his neighbor. He will redden or pale where others do not.

Anger.—Anger may throw one man in a violent passion, while it may make another merely frown and look stern. Joy may make one fairly intoxicated, while it may evoke almost no outward sign in another.

Love.—Love, the strongest passion of all, will make one person the gentlest of creatures. It will make him think more of others. He will do anything for his beloved. His all he is willing to risk, even his very life. Another will be made fierce by this same passion. Murderous thoughts will be aroused in his breast. He thinks of the welfare of no one, not even of the object of his love. He is willing to sacrifice the happiness, the honor, even the life of another.

Grief.—Grief will soften some people and harden others.

Every emotion, however, is shown by some sign, generally by the same actions in all, but occasionally by different expressions.

TWO VIEWS IN REGARD TO PASSIONS.

There are two ways of looking at our emotions and their manifestations.

Emotion.—The view we naturally take of our passions is the following. We are made conscious of some fact. This knowledge excites in us a feeling called the emotion, and this state of mind causes all the actions and expressions that go with the passion. We lose a parent, are sorry and weep. We meet a wild animal, are frightened and run. We are insulted by a rival, are angry and strike.

Expression.—Another way of looking at the matter is this. What immediately follow the knowledge of the fact causing our emotion are the action and the expression. The passion is the feeling of the actions. The death of our mother makes us cry. We feel sorry because we cry. In like manner we are afraid because we tremble, and are angry because we strike.

This latter view seems at first very foolish, but it is held by a great many investigators.

THE BODILY FEELING THAT ACCOMPANIES EVERY PASSION.

Every one of the actions is felt the same moment the emotion occurs. If the reader has never paid any attention to the matter he will be both interested and astonished to learn how many different bodily feelings he can detect in himself as present with every passion. He will be surprised to find out how for each emotion there is a different action or expression.

Of course a man can not stop in the middle of any passion to study what movements are taking place. But he can observe the more quiet states.

When worried by any slight trouble one will usually find that his brows are knitted.

When a person is embarrassed for the moment he feels something in his throat that makes him either swallow, clear his throat or give a slight cough.

When anyone is very much amused he will find it almost impossible to keep his features straight.

NO PASSION WITHOUT AN ACCOMPANYING ACTION.

There can be no consciousness of any motion without an accompanying feeling.

Fear.—What kind of an emotion of fear would be left if there were not present the feeling of quickened heart-beats or of shallow breathing, of goose-flesh, rising hair and queer empty feelings about the stomach?

Rage.—Who can fancy the state of rage and picture no boiling in the chest, no flushing of the face, no quivering of the nostrils and no clenching of the teeth?

Tears.—What would grief be without its tears, its sobs, its suffocation of the heart, its pang in the breast?

DIFFERENT EXPRESSIONS OF THE SAME PASSION.

As a rule, the same passion effects all men in the same way. There are exceptions, however.

We have all seen people dumb with joy instead of talking and shouting. We have seen how fright will cause the blood to rush into a man's head instead of driving it away. We have witnessed those who have met with losses running around in their grief, crying and lamenting instead of sitting down, bowed and silent.

ARE THE PASSIONS FIRST FELT IN THE MIND OR IN THE BODY?

Let those who call this question silly pay attention to the following instances:

When we are reading or listening to a story we are often surprised at the shiver that suddenly flows over our skin and at the heart swellings and tears that sometimes unexpectedly excite us.

If we are walking in the woods and suddenly see a dark form, our heart stops beating and we catch our breath intently before we have time to form in our mind any idea of danger.

If we see anyone walking near a precipice we shudder and shrink back, although we know him to be safe and have in our mind no feeling of real danger.

An Illustrative Case.—A writer tells of his astonishment, when a boy of eight, at fainting at the sight of blood. He was watching a horse being bled. The blood was in a bucket with a stick in it.

Out of curiosity the boy picked up the stick and stirred the blood around and saw it drop from the end of the stick.

Suddenly the world grew black before his eyes, his ears began to buzz and he knew no more.

He had never heard that the sight of blood produced faintness and sickness, and he had no repugnance to it and no thought of danger from it. And even at his young age he could not help wondering how the mere presence of a pailful of red fluid could cause such violent effects in his body.

Fright.—When a person jumps at a loud sound he says the noise frightened him. But he never felt any real fear or thought there was any danger.

Many men can never grow used to standing beside a cannon when it is fired off, although they know perfectly well that there is no danger either to themselves or others. The mere sound is too much for them.

CAN THE BODILY MANIFESTATION OF AN EMOTION PRECEDE THE PASSION ITSELF?

Many give a negative answer to this question.

An actor, they say, can simulate an emotion and yet be inwardly cold. We can all pretend to cry and not feel grief. We frequently feign laughter without being at all amused.

On the other hand, experience shows us that the bodily manifestation sometimes does precede the emotion.

Emotions Feed Themselves.—Everyone knows how a panic in a theatre is increased by flight. How the giving way to the symptoms of grief or anger increases those passions themselves.

Each fit of sobbing makes the sorrow more acute and calls forth another fit, stronger still. And it is only with absolute exhaustion that rest comes.

In a rage we all know how a man can work himself up. How the more he storms the angrier he gets.

Suppressing Passion.—Refuse to give in to the outward expression of a passion and the passion itself dies.

Count ten before venting your anger and in nearly every instance the occasion will seem ridiculous.

On the other hand, sit all day in a moping posture, sigh and reply to every question with a dismal voice, and you will remain melancholy.

HOW TO CONTROL AND DEVELOP PASSIONS.

It is possible for anyone to conquer an undesirable passion, as is well known by all who have had experience.

Sullenness.—We must faithfully, and at first in cold blood, go through the *outward movements* of those opposite dispositions that we wish to cultivate. If we are persistent we will finally meet with due reward. The sullen expression will fade out and real cheerfulness will come in its stead.

Frowning.—Whenever you catch yourself frowning, smooth out your brow. When you find you are talking in a high tone, lower your pitch. When you discover your fists clenched, open out your hand. When you feel like saying something nasty, refrain, and whenever an opportunity arises say something pleasant.

Road to Happiness.—If you carefully and faithfully carry out these directions you will find that you do not become angered so easily and that when you do become angry you do not remain so long. You will begin to feel more kindly to others and you will lead a happier life.

TESTIMONY BY STUDENTS, PHYSIOGNOMISTS AND ACTORS.

It is curious how even the temporary imitation of the outward expression of a feeling will bring about the feeling itself.

Expression of Mental Condition.—The great German student, Fechner, says: "One may find by one's own observation that the *imitation* of the bodily expression of a mental condition makes us understand it much better than the merely looking on. * * * When I walk behind some one whom I do not know, and imitate as accurately as possible his gait and carriage, I get the most curious impression of feelings as the person himself must feel. To go tripping and mincing after the fashion of a young woman puts one, so to speak, in a feminine mood of mind."

Facial Expression.—Burke writes of the physiognomist, Campanella: "This man, it seems, had not only made very accurate observations on human forms but was very expert in mimicking such as were in any way remarkable. When he had a mind to penetrate into the inclinations of those he had to deal with, he composed his face, his gestures, and his whole body, as nearly as he could, into the exact similitude of the person he intended to examine; and then carefully observed what turn of mind he seemed to acquire by the change. So that, says my author, he was able to enter into the dispositions and thoughts of people as effectually as if he had been changed into the very men."

Mimicry.—Burke, the great actor, goes on to say of himself: "I have often observed that, on mimicking the looks and gestures of angry, or placid, or frightened, or daring men, I have involuntarily found my mind turned to that person whose appearance I strove to imitate; nay, I am even convinced it is hard to avoid it, though one strove to separate the passion from its corresponding gestures."

Many actors declare that they can perfectly mimic the outward appearance of emotion in face, gait and voice without feeling the emotion at all.

Experience of Actors.—According to Mr. Archer, however, who has made a very instructive statistical study of this question, whenever an actor plays a part well he is overcome with the emotion of the part. In his book, "The Anatomy of Acting," he quotes many noted players.

Paleness.—"I often turn pale," writes Miss Isabel Bateman, "in scenes of terror or great excitement. I have been told this many times and I can feel myself getting very cold and shivering and pale in thrilling situations." "When I am playing rage or terror," writes Mr. Lionel Brough, "I believe I do turn pale. My mouth gets dry, my tongue cleaves to my palate. In Bob Acres, for instance (in the last act), I have to continually moisten my mouth or I shall become inarticulate. I have to 'swallow the lump,' as I call it."

All artists who have had much experience of emotional parts are absolutely unanimous. . . . .

DOES THE EXERCISE OF A PASSION MAKE IT INCREASE OR CEASE.

Exercise of Passion.—It is said by some that manifesting an emotion does not increase it. On the contrary, it is claimed, it makes it cease. Rage melts away after a real good outburst. It is the pent-up emotions which are not expressed that keep up a constant turmoil in the brain.

Increase of Passion.—On the other hand others hold that if a man repress the expression of his passions he will find that they will expire if they get no vent at all. While if he permits their outbreak to occur frequently he will find them increase in intensity as time goes on.

LOVE.

Nature of Love.—This is the strongest passion of all and by many considered the most irresistible. It is described by Bain as "a massive pleasure growing out of definite relations to persons or sentient creatures, and pointing to the embrace." Strange to say, however, it often is lacking or at least checked by ordinary shyness or by the instinct of personal isolation. This latter is the actual repulsiveness to us of the idea of intimate contact with most of the persons we meet. It exists more strongly in men with respect to one another, and more strongly in women with respect to men.

Parental Love.—Parental love is stronger in women than in men, at least in the early childhood of its object.

According to Schneider as soon as a wife becomes a mother the centre of the world is no longer herself but her child. She does not think of her own hunger; she must first be sure that the child is fed. It is nothing to her that she herself is tired and needs rest so long as she sees that the child's sleep is undisturbed. Now she has the greatest patience with the ugly, piping cry-baby, whereas until now every discordant sound, every slightly unpleasant noise made her nervous. Every limb of the still hideous little being appears to her beautiful, every movement fills her with delight.

Beauty of Devotion.—James says that the passionate devotion of a mother, ill herself, perhaps, to a sick or dying child, is perhaps the most simply beautiful spectacle that human life affords. Contemning every danger, triumphing over every difficulty, outlasting all fatigue, woman's love is here invincibly superior to anything that man can show.

HATRED.

Nature.—This of course is the direct opposite of love. Among the ordinary causes are the sense of some one wrong never satisfied, the recognition of a standing disposition to cause harm, an obstructive position maintained and often mere aversions to the character, conduct or even appearance of another person.

A study of the way in which man shows hatred might prove interesting.

How Hatred is Shown.—The head is thrown back and the body drawn away while the hands are brought forward, as if to defend one's self against the hated object. The eyes are partially closed, the upper lip is raised and the nose is closed. Threatening movements then follow. The individual frowns, his eyes are wide open, he shows his teeth or he may grind his teeth and shut his jaws. He may also open his mouth and protrude the tongue, clinch his fists, threaten with his hands or stamp with his feet.

Other Manifestations.—He often takes deep inspirations, pants, growls and utters various cries, or repeats a word or syllable. Sudden weakness or trembling of the voice may occur, or spitting. The man may tremble, his lips and face may twitch. He may bite his fist or nails, laugh sardonically. He may turn red or pale. His nostrils may dilate widely and his hair stand up on end. All of the above may occur, though not all in the same person.

GRIEF.

Nature of Grief.—With grief there is a weakness which makes it cost an effort to perform actions usually done with ease. Lange calls it a feeling of weariness. Movements are made slowly, heavily, without strength, unwillingly and with exertion, and are limited to the fewest possible.

How Grief Shows.—By this the grieving person gets his outward stamp. He walks slowly, dragging his feet and hanging his arms. His voice is weak and without resonance. He prefers to sit still, sunk in himself and silent. The neck is bent, the head hangs bowed down, the jaw drops, making the face look long and narrow. There is a feeling of weariness and heaviness, of something which weighs upon one.

Weeping.—The most regular manifestations of grief, of course, are the weeping, with its profuse secretion of tears, its swollen reddened face, red eyes and increased secretion from the nose.

Control of Grief.—These are the natural evidences of grief. They are more or less controlled by different persons, and by some are suppressed altogether.

FEAR.

Fear is a genuine instinct, according to James, and one of the earliest shown by the human child.

Effect of Noises.—Noises seem especially to call it forth. M. Pereg believes that children between three and ten months are more often alarmed by what they hear than by what they see. He quotes the case of a child, three and a half months old, who, in the midst of the turmoil of a conflagration in presence of the devouring flames and ruined walls, showed neither astonishment nor fear, but smiled at the woman that was taking care of him while his parents were busy. The noise, however, of the trumpet of the firemen, who were approaching, and that of the wheels of the engine made him start and cry.

Other Effects of Noise.—The effect of noise in heightening any terror we may feel in after years is very marked, according to James. The howling of the storm, whether on sea or land, is a principal cause of our anxiety when exposed to it. A dog attacking us, he also believes, is much more dreadful by reason of the noises he makes.

Effect of Strange Things.—Strange men and strange animals, either large or small, excite fear, but especially men or animals advancing toward us in a threatening way. Certain kinds of vermin, especially spiders and snakes, seem to excite a fear usually difficult to overcome. Black things, and especially dark places, holes, caverns, and so forth, arouse a peculiarly gruesome fear. Even an adult can easily observe that an uncomfortable timidity steals over him in a lonely wood at night, although he may have the fixed conviction that not the slightest danger is near.

The Supernatural.—Fear of the supernatural is one variety of fear. To bring the ghostly terror to its height there must be other dreadful elements, such as loneliness, darkness, inexplicable sounds, especially of a dismal character, moving figures half discerned, and so forth.

How Fear Shows.—In fear the eyes and mouth are widely opened and the eyebrows raised. The frightened man at first stands like a statue, motionless and breathless, or crouches down as if instinctively to escape observation. The heart beats quickly and violently so that it knocks against the ribs. The skin instantly becomes pale as just before fainting. Cold sweat breaks out, the hairs on the skin stand erect and the muscles shiver. The breathing is hurried, the mouth becomes dry and is often opened and shut. From this cause the voice becomes husky or indistinct, or may altogether fail.

ANGER.

Manifestations.—Anger consists in picturing in the mind the actions and impression which would occur while inflicting some kind of pain. The destructive passion, according to Spencer, of which anger is a representative, is shown in a general tension of the muscular system, in gnashing of teeth and protrusion of the claws, in dilated eyes and nostrils and in growls.

SYMPATHY.

Nature of Sympathy.—In man, the sight of suffering or danger to others is a direct exciter of interest, James believes, and an immediate stimulus, if no complication hinders, to acts of relief. Some forms of sympathy, that of mother and child for example, are instinctive and not due to the mother thinking of the board and lodging and other support to be reaped in old age. Danger to the child blindly and instantaneously stimulates the mother to actions of alarm or defense. Menace or harm to the adult beloved or friend excites us in a corresponding way, often against all dictates of prudence.

SOCIABILITY.

The Social Desire.—Man is excited by the absence of his kind. To be alone is one of the greatest evils for him. Solitary confinement is by many regarded as a mode of torture too cruel and unnatural for civilized countries to adopt. To one long pent up on a desert island the sight of a human footprint or a human form in the distance would be the most tumultuously exciting of experiences, in the opinion of James. In diseased states of the mind one of the commonest symptoms is the fear of being alone.

ENVY OR JEALOUSY.

Everyone knows how difficult it is not to covet whatever pleasing thing we see, and how the sweetness of the thing often is as gall to us as long as it is another's. When another is in possession the impulse to appropriate the thing often turns into the impulse to harm him. Thus envy or jealousy ensues.

SECRETIVENESS.

James says: "Secretiveness, which although often due to intelligent calculation and the dread of betraying our interests in some more or less definitely foreseen way, is quite as often a blind propensity, serving no useful purpose, and is so stubborn and ineradicable a part of the character as fully to deserve a place among the instincts."

THE PASSION FOR HUNTING AND FIGHTING.

Hunting.—This passion is very general in boys who are brought up naturally, especially in the country. Everyone knows what pleasure a boy takes in the sight of a butterfly, fish, crab or other animal, or of a bird's nest. He has a strong passion for pulling apart, breaking, opening and destroying all complex objects.

Fighting.—Rochefoucald says that an apostle of peace will feel a certain vicious thrill run through him and enjoy a vicious brutality as he turns to the column in his newspaper at the top of which "Shocking Atrocity" stands printed in large capitals.

Consider the enormous annual sale of revolvers to persons, not one in a thousand of whom has any serious intention of using them, but of whom each one has his carnivorous self-consciousness tickled by the notion, as he clutches the handle of his weapon, that he will be rather a dangerous customer to meet. See the ignoble crew that escorts every great pugilist! The first blow at a prize fight is apt to make a refined spectator sick, but his blood is soon up in favor of one party and it will then seem as if the other fellow could not be banged and pounded and mangled enough—the refined spectator would like to reinforce the blows himself.

THE PASSION FOR PLAY.

A boy cannot help running after another boy who runs provokingly near him. The sexes differ somewhat in their plays. As Schneider says: "The little boy imitates soldiers, models clay into an oven, builds houses, makes a wagon out of chairs, rides on horseback upon a stick, drives nails with a hammer, harnesses his brethren and comrades together and plays the stage-driver, or lets himself be captured as a wild horse by someone else.

Girl Play.—"The girl, on the contrary, plays with her doll, washes and dresses it, strokes it, clasps and kisses it, puts it to bed and tucks it in, sings it a cradle-song, or talks to it as if it were a living being."

Adult Play.—The passion for play is also shown in the love for festivities, ceremonies, ordeals, and so forth. The lowest savages have their dances. The various religions have their solemn rites and exercises. The government officials and the military bodies exhibit their grandeur by processions and ceremonies. We have our operas and parties and masquerades.

AVARICE.

Characteristics.—James claims that there are all kinds of misers. The common sort, the excessively niggardly man simply exhibits the fact that a possibility has often a greater influence over our mind than an actuality. A man will not marry now, because to do so puts an end to his indefinite possibilities of choice of a partner. He prefers the latter. He will not use open fires or wear his good clothes because the day may come when he will have to use the furnace or dress in a worn-out coat, "and then where will he be?" For him better the actual evil than the fear of it. So it is with the common lot of misers.

PITY.

Pity is sympathy with pain, according to Bain.

The sympathizer takes on the pain that he witnesses and instead of ridding himself of the disagreeable feeling thus assumed by turning his back upon the sufferer and looking out for some diversion, he works it out as if it was his own by such relief as he is able to afford.

GRATITUDE.

The simplest form of gratitude is the return of pleasure for pleasure received. Bain says: "Proper gratitude does not begin until we sympathetically enter into other peoples' pleasures and pains, and become conscious of being causes of the one or the other. It also supposes that we take notice of others as the causes of our pleasures and pains, and have associations in consequence. At this stage there is an increase of the satisfaction of giving good offices when we have ourselves experienced good at the hands of the same person."

ADMIRATION.

This is the recognition of superior might or excellence in any department of human capability. It has also been called wonder mixed with love.

ESTEEM.

The objects of our esteem are all those about us that fulfill the tasks imposed upon them by their situation or display the virtues that make men useful members of society.

SHAME.

This feeling is caused by a dread of being condemned or thought ill of by others. A man is shamed openly when publicly censured. One is also put to shame by falling into any act that people are accustomed to disapprove and will certainly censure in their own minds, although they may refrain from actually pronouncing condemnation.

PRIDE.

The expression of pride consists in movements tending to increase in size and height. The breathing is deep, the chest expanded so that the individual is "puffed up" or "swollen" with pride. The body and head are held more erect, the gait is assured, the mouth firmly closed and the teeth clinched.

SEXUAL SCIENCE.

ITS BEARING ON HEALTH.

Life Propagation.—The propagation of the human species is not committed to accident. Nor is it left to the caprice of the individual. It is made secure in a natural instinct which, with irresistible force and power, demands fulfillment. It is not only sensual pleasure that is found in the gratification of this natural impulse. There exists higher feelings of satisfaction in perpetuating one's own single, short and perishable existence by the transmission of one's mind and form to a new being.

Man Higher than the Animal.—In coarse, sensual love and in the lustful desire to satisfy this natural instinct, man stands on a level with the animal. But man has the power to raise himself to a height where this natural instinct no longer makes him a slave. Higher and nobler feelings are awakened, which, notwithstanding their sensual origin, lift him into a world of beauty, holiness and morality.

Holiness of Man's Instinct.—On this height man overcomes his natural instinct. From an ever-flowing spring he draws material and inspiration for higher enjoyment, for more earnest work and for the reaching of the highest goal. The sexual feeling has been called the foundation for the development of the social feeling. In the words of a great student: "Were man to be robbed of the instinct of procreation and all that arises from it mentally, nearly all poetry and, perhaps, the entire moral sense as well, would be torn from his life."

The Power of Sexuality.—Sexuality is the most powerful factor in individual and social existence. It is the strongest incentive man has to exert his strength and acquire property. It spurs him to the foundation of a home. By it are first awakened the feeling of love, first for one of the opposite sex, then for his offspring, and last, in a wider sense, for all humanity. Thus all morality and a great part of religion depend upon the existence of the sexual feeling.

Dangers of the Sexual Life.—Though the sexual life leads to the highest virtues and even to the sacrifice of self, yet in it lies a great danger. Unless properly checked it may degenerate into powerful passions and develop the gravest vices. When love is permitted to become an unbridled passion it is like a fire that burns and consumes everything. It is like a pit that swallows all—honor, fortune and happiness.

History of the Sexual Life.—It is interesting to know how the sexual life developed throughout the history of the world. It is important to know the different stages through which it passed from the ancient and barbarous ages to the morality and civilization of to-day.

Primitive Peoples.—Among very primitive people the satisfaction of the sexual appetite of man seems like that of the animal. Openness in the sexual act is not shunned. Men and women are not ashamed to go naked. Even to-day we see savages in this condition. The Australians and the Polynesians furnish good examples. It even exists in the United States of America, among the Malays of the Philippines.

The Female Common Property.—Among these peoples the female is the common property of the male. She is for the time being the prize of the strongest. The men fight for the possession of the most beautiful of the opposite sex. A woman in such a country is a movable thing, a ware, an object of bargain and sale and gift. She is a thing to satisfy lust and to work.

Morality in Sexual Life.—Morality in sexual life began when there appeared a feeling of shame in the manifestation of the natural instinct. Then arose modesty in the intercourse of the sexes. Efforts were made to conceal the parts. "And they knew that they were naked."—Genesis, iii, 7.

Modesty and Climate.—The development of this degree of culture is favored by the coldness of the climate and the necessity for the complete protection of the body. Those who have investigated the primitive people have discovered that modesty appears among the northern races much earlier than among the southern.

Advance of Woman.—The next stage in the development of culture in sexual life is noted when the female ceases to be a movable thing. She becomes a person. For a long time still she is placed far below the man socially. Yet the idea is developed that the right disposal of herself and her favors belong to her. She then becomes the object of the male's wooing. Feelings of morality begin to be added to the barbarous sensual feeling of sexual desire. Property in women ceases to exist. Individuals of the opposite sexes feel themselves drawn toward each other by their minds and appearances. They show love for each other only.

Foundation of Chastity.—At this stage woman has a feeling that her charms belong only to the man of her choice, and she wishes to conceal them from others. Thus, by the side of modesty, are laid the foundations of chastity and faithfulness—as long as the bond of love lasts.

Woman as a Housewife.—Woman attains this degree of social elevation earlier, when a tribe gives up its wandering life and settles down to a state of fixed habitation. For then man obtains a house and home, and the necessity arises for him to possess in woman a companion for the household—a housewife. Among the nations of the East, the Egyptians, the Israelites and the Greeks, early attained this stage of culture, and among those of the West the Germans were the first to elevate women.

Points of Female Esteem.—Among all these races virginity, chastity, modesty and sexual faithfulness were held in great esteem. This was in marked contrast with other nations, which offer the female of the house to the guest for his sexual enjoyment.

Women in Japan.—This stage in the culture of sexual morality is quite high. It appears much later than other forms of culture and civilization. This is seen in the Japanese, who are considered quite civilized and have accepted many of the modern improvements. In Japan it is the custom to marry a woman only after she has lived for a year in the teahouses, which correspond with our houses of prostitution. To the Japanese the nakedness of women is nothing shocking. At all events, among them every unmarried woman can prostitute herself without lessening her value as a future wife. This is proof that with this remarkable people woman possesses no moral worth. She is valued in marriage only as a means of enjoyment, reproduction and work.

Bible Women.—In Biblical times women occupied an inferior position to man. And even after Biblical times woman was still considered as an inferior creature. This may be due in part to the account in Genesis of the secondary creation of woman from the rib of man—Genesis, ii: 21 and 22: "And the Lord God caused a deep sleep to fall upon Adam, and he slept; and He took one of his ribs and closed up the flesh instead thereof; and the rib, which the Lord God had taken from man, made He a woman, and brought her unto the man." It was also due probably to her part in the fall of man and the consequent curse: "Thy will shall be to thy husband, and he shall rule over thee." Genesis, iii: 16. Since the fall, for which the Old Testament made woman responsible, became the foundation for the teachings of the Church, the wife's social position in the early centuries could but remain inferior.

State of Polygamy.—Moreover, polygamy is expressly recognized in the Old Testament—Deuteronomy, xxi: 15: "If a man have two wives, one beloved and the other hated." The value of each sex among the Jews is shown by Leviticus, xxvii: 3 and 4: "And thy estimation shall be of the male from twenty years old even unto sixty years old, even thy estimation shall be fifty shekels of silver, after the shekel of the sanctuary; and if it be a female then thy estimation shall be thirty shekels." Even in the New Testament polygamy is not distinctly forbidden. The only passage in the Gospels favoring woman is that forbidding the putting away a wife—Matthew xix: 9: "And I say unto you, whosoever shall put away his wife, except it be for fornication, and shall marry another, committeth adultery; and whoso marrieth her which is put away doth commit adultery."

Paul's Position as to Woman.—The Epistles of Paul specifically declare that the position of woman shall not be altered—II Corinthians, xi: 2-3; Ephesians, v: 22: "Wives, submit yourselves unto your husbands;" and 33, "And the wife *see* that she reverence her husband."

Early Christianity and Women.—Woman's position remained inferior in the early days of Christianity. Passages in Tertullian show how the Fathers of the Church were prejudiced against woman by Eve's guile: "Woman, thou shouldst forever go in sorrow and rags, thy eyes filled with tears! Thou hast brought man to the ground!"

St. Hieronymous has nothing good to say of woman. He says: "Woman is a door for the devil, a way to evil, the sting of the scorpion." "De sultur feminarium," i: 1.

Canonical Law declares: "Only man was created in the image of God, not woman; therefore, woman should serve him and be his maid!"

The Provincial Council of Macon, in the sixth century, earnestly debated the question whether woman had a soul.

Even polygamy flourished among the early Christians. Christian princes, for example, the Merovingian kings, Clotaire I, Childebert I, Pepin I and many of the royal Franks, lived in polygamy, and at that time the Church made no opposition to it.

These ideas of the Church necessarily had a direct effect on the peoples embracing Christianity. Among the Germans, after the acceptance of the new faith, the price to be paid for a wife decreased considerably.

Christianity Emancipates Woman.—There was ever in the spirit of Christianity, however, that which would free woman and raise her from the inferior position occupied by her in the ancient world and in the Old Testament. Her social position began to improve as soon as the spirit of Christianity had gained a victory over tradition and scholasticism.

It was the Council of Trent that first made clear and unquestionable the symbolic and sacramental character of marriage.

Christianity gave the most powerful impulse to the moral elevation of the sexual relations by raising woman to social equality with man and elevating the bond of love between man and woman to a religio-moral institution.

Mohammedan Women.—Mohammed was really honest in his desire to raise woman from her place as a slave and concubine to a higher social and matrimonial plane. Nevertheless, in the Mohammedan world woman remained far below man. Only the man could obtain divorce, and he could obtain it very easily. Woman was kept from participation in public life under all circumstances. This, of course, hindered her intellectual and moral development. In consequence of this the Mohammedan woman has always remained essentially a means of sensual gratification and procreation.

This inferior position of woman is seen in the Mohammedan religion in reference to the hereafter. Heaven to the Mussulman is filled with the delights of a harem full of houris.

WOMEN'S PLACE IN HIGHER CIVILIZATION.

The fact that in higher civilization love must be single and not on a lasting contract was thus recognized.

If nature does no more than provide for reproduction, a family or State cannot exist without a guarantee that the offspring shall flouish physically, mentally, morally and intellectually.

Christianity gained both mental and material superiority over the polygamous races, especially Mohammedan, through the equalization of woman and man. It also obtained this hold by establishing single marriage and securing it by legal, religious and moral ties.

DIFFICULTY IN KEEPING LOVE PURE.

In spite of all the aids which religion, law, education and morality give civilized man in the bridling of his passions, he is always in danger of sinking from the clean height of pure, chaste love into the mire of common sensuality.

In order to maintain one's self on such a height a constant struggle is required between natural impulses and morals, between sensuality and morality.

Only characters endowed with strong wills are able to completely free themselves from sensuality, and share in that pure love from which spring the noblest joys of human life.

THE ELEMENTS OF SEXUAL DESIRE.

In sexual desire, love, the expectation of unbounded happiness, is the primary element. The feeling of dependence also exists, but it is of secondary development. The nucleus of this feeling exists both in the male and in the female, but it may remain undeveloped in one. As a rule, owing to her passive part in procreation and social conditions, it is more pronounced in women.

YOUTHFUL LOVE.

Youthful love has a romantic, idealistic character. It raises the beloved object on a lofty pedestal. In its beginning it is free from the sensual element and turns to forms of poetry and romance. With the awakening of sensuality there is danger that this power of making its object perfect may be directed toward persons of the opposite sex who are mentally, physically and socially of inferior station. Love is more blind in this stage than in any other.

PURELY SENSUAL LOVE.

In love of this nature there may occur unhappy marriages where the husband and wife are unsuited to one another. Here occur seductions and errors, with the whole tragedy of a passionate love that comes in conflict with the dictates of social position and prospects.

It is this love that sometimes terminates in suicide or double suicide. Over-sensual love can never be lasting and true. For this reason the first love is, as a rule, very fleeting. Because it is nothing else than the flare of a passion, the flame of a fire of straw.

TRUE LOVE.

Only the love that rests upon a recognition of the social qualities of the beloved person, only a love which is willing not only to enjoy present pleasures, but to bear suffering for the beloved object and sacrifice all is true love. The love of a strongly constituted man shrinks before no difficulties or dangers in order to gain and keep possession of its object.

DANGEROUS LOVE.

Love expresses itself in acts of heroism and daring. Such love is in danger, under certain circumstances, of becoming criminal, if moral principles be weak. Jealousy is an ugly spot in this love. It may lead to the greatest crimes. This daring love will stop at nothing to gain its end. It does not hesitate to do away with any obstacles that may be in the way.

SENTIMENTAL LOVE.

The love of a weakly constituted man is sentimental. It sometimes leads to suicide when it is not returned or meets with obstacles. Sentimental love is in danger of becoming a caricature when the sensual element is weak.

Such love is flat and soft, and may be even silly. But the true expression of this powerful feeling awakens appropriate pity, respect or sorrow in the hearts of others.

DIFFERENCES BETWEEN MALE AND FEMALE LOVE.

Love in the Man.—Undoubtedly man has a much more intense sexual appetite than woman. As a result of a powerful natural instinct, at a certain age, a man is drawn toward a woman. He loves sensually and is influenced in his choice by physical beauty. In accordance with the nature of this powerful impulse, he is aggressive and violent in his wooing. At the same time this demand of nature does not constitute all of his mental existence. When this longing is satisfied, love temporarily retreats behind other vital and social interests.

Love in the Woman.—With a woman it is quite otherwise. If she is normally developed mentally, and well bred, her sexual desire is small. If this were not so the whole world would become a brothel and marriage and a family impossible. It is certain that the man that avoids women and the woman that seeks men are abnormal. Woman is wooed for her favor. She remains passive. This lies in her sexual organization, and is not founded merely on the dictates of good breeding.

Woman's Sexual Sphere.—Nevertheless the sexual sphere occupies a much larger place in the mind of woman than in that of man.

The need of love in her is greater than in man, and is continual, not intermittent. But this love is rather more spiritual than sensual. While a man loves a woman first as wife and then as mother of his children, a woman first thinks of a man as the father of her children and then as husband.

Choice of a Husband.—In the choice of a life companion a woman is influenced much more by the mental than by the physical qualities of a man. When she has become a mother she divides her love between child and husband. Sensuality disappears in the mother's love.

Strength of Sexual Love.—A woman loves with her whole soul. To her love is life; to a man it is the joy of life. To him misfortune in love is a wound; but it costs a woman her life, or, at least, her happiness. A question worthy of consideration is whether a woman can truly love twice in her life. Certainly the mental inclination of woman is monogamous, while in man it is polygamous.

MAN WEAKER THAN WOMAN.

The weakness of man in comparison with woman lies in the great intensity of their sexual desires. Man becomes dependent upon woman. The weaker and more sensual he becomes, the more does he become dependent upon her.

MARRIAGE.

In the cultivated social life of to-day, woman occupying a sexual position and concerning herself in the interests of society can only be thought of as a wife.

The aim and ideal of woman, even when she is sunken in the mire of vice, is, and remains, marriage.

Woman desires not only satisfaction of her sexual feeling, but also protection and support for herself and her children.

A man of right feeling, no matter how sensual he may be, demands a wife that has been, and is, chaste.

THE MARRIAGE RIGHT AND DUTY.

Woman far surpasses man in love, partly because, through heredity and education, her native element is love, and partly because she has finer feelings.

Even in a man of the very highest breeding it cannot be found objectionable that he recognizes woman as a means of satisfying his natural instinct.

But it becomes his duty to belong only to the woman of his choice.

In a civilized state this becomes a binding social obligation, marriage. And inasmuch as the wife requires for herself and children protection and support, it becomes a marriage right.

WHAT ATTRACTS AND UNITES A MAN AND A WOMAN.

It is of great importance to examine the events of the mind that draw a man and a woman together and unite them. So that, of all other persons of the same sex, only the beloved one seems desirable.

If one could foresee design on the part of nature this "harmony of souls," this "heart-hand" could be easily explained.

The fact of fascination by a single person of the opposite sex, with indifference to all others, as it occurs between true and happy lovers, would then appear as a wonderful creative provision to insure single unions for the promotion of their object. To the scientific student, however, this love does not, by any means, appear as a "soul-mystery." In the majority of cases it may be referred to certain peculiarities of form or mind, as the case may be, by which the attractiveness of the beloved person is excited.

REAL LOVE.

On slight reflection anyone will see that real love can be spoken of only when the whole person is both physically and mentally the object of adoration. Love must always have a sensual element. There must be a desire to possess the beloved object, to be united with it and fulfill the laws of nature.

Purely Sensual Love Not Genuine.—But when merely the body of the person of the opposite sex is the object of love, when satisfaction of sexual pleasure is the sole object, without desire to possess the soul and enjoy mutual communion, love is not genuine.

Platonic Love Not Genuine.—Nor is the love genuine of Platonic lovers, who have only the soul and avoid sensual pleasure.

For the former, merely the body, and for the latter, simply the soul is the attraction. In both cases it is only the part that attracts that is loved, not the whole person, body and soul.

RELATION OF SEXES REVERSED.

In regard to increasing one's attractiveness and charms, civilization has gradually reversed the relation of the sexes. While in civilized society woman exercises her ingenuity to increase her attractiveness, among savages it is the men who are anxious to increase their physical charms. This is probably due to the fact that civilization has gradually transferred the liberty of choice from woman to man.

WHAT ATTRACTS MOST.

Among the many things that may attract and charm, there are certain ones that act for a majority of persons.

As such for a man may be mentioned the hair, the hand, the foot of a woman, and the expression of her eyes.

These facts play a prominent part in the feminine mind, either consciously or unconsciously.

LIFE AND MORALS.

AS AFFECTING HEALTH.

Problem of Life.—The problem of life is the one great question that has puzzled all students since time immemorial. And not only students. There is no one to whom the question has not arisen, "What is life and why are we here?" The philosopher, the theologian, the practical man of business and the pleasure-seeker all give different answers. But whether a man believes life here to be but a preparation for another and better world, or whether he believes that the object of life is happiness, one thing must be recognized.

Life Duties.—We are here on earth a race of human beings, with certain passions and certain feelings, and with bodies that must grow, develop and be propagated. As family beings we come in contact with our own flesh and blood, and with this relationship come certain duties. We are part of those that went before, we were cared for by them until we were in a condition to care for ourselves. It is now our duty to leave behind us those who will inhabit the earth when we are gone. Upon us falls the responsibility if the succeeding generation be not healthy and moral. An understanding of man, how he is constituted and how he is reproduced and developed is essential for grappling the problem of life.

Duties in Reproduction.—The duties concerned in reproduction must be thoroughly realized and appreciated if the strength and vigor of the race and nation is to be maintained.

Consequences of Neglect.—Neglect of the first duty of man has caused the downfall of nations and the dwarfing and weakening of a once strong people.

Thoughtlessness in youth is responsible for untold misery.

Ignorance in young maidenhood has led to lives of unspeakable suffering.

Recklessness in selection is the cause of much of the unhappiness in the world.

Carelessness at important events claims more victims than all the wars.

Inexperience where experience is essential is responsible for many ruined constitutions and wrecked lives.

A medical work which does not give that knowledge that will prevent disease and rear a healthy generation is not fulfilling its purpose.

The Great Law of Sex.—Everything that has life, whether the smallest animal or the most modest flower, recognizes the distinction of sex. Not only in the animal kingdom, but even in the vegetable kingdom, is the law of gender obeyed.

Plant Sexuality.—The flower we see in the field has its pistil with its ovary and its stamens with their pollen. And not until the male element, the pollen, falls upon the female element, the pistil, can the seeds form in the ovary and burst forth to mature into another generation of plants. How eagerly does the pollen await the coming of the butterfly and bee to the flower on which it grows! And how tightly does it cling to its wing or foot until it is brushed off on the pistil of the next flower the insect visits! And even the tall, stately trees, whom no one would suspect of sexual desires, put threads or sails on their male blossom so that the wind will carry it to the female element of the nearest branch. The farmer would wait in vain for his corn ear if the dust from the waving tassels did not drop on the flowing silk below.

Animal Sexuality.—In the animal kingdom how varied are the methods the male adopts to attract the female! The gay butterfly paints his wings in the brightest colors so he may attract a mate and so furnish future butterflies to beautify the fields. The cricket hidden among the tall grass can chirp and let his friends know where it can be found. The bird trills its sweetest notes to delight the female when hunting for a nestmate in spring. And so throughout the whole animal and vegetable world, even down to man. Adam would have been the only man in the world had Eve not been created. With man and woman in the world it was no longer necessary to rob either of a rib in order that the world might be populated.

Heredity Throughout Nature.—How exact a copy of the parents is the offspring! The gardener never wonders, when he plants the seeds, what kind of flowers will spring up. The bulb he puts in the earth came from a lily and will bring forth a similar flower when it is grown. When the maple seed falls to the ground nothing but a maple tree will spring up. The farmer is never in doubt when he puts duck eggs or those of game under a white leghorn as to what will come out of the shell. The frog spawn will develop tadpoles, the shad eggs will turn into shad fish, and the offspring of the squirrel will resemble its parents. The calf of the Holstein will be like its kind, and may even have the white star of its mother on its nose.

Heredity in Man.—And so with man. The Indian squaw will have a papoose, while the negress will present her husband with a pickaninny.

The hot blood of the Spaniard will be seen in the Spanish babe, and the little Yankee baby will grow up cool and calculating.

Inheritable Traits and Diseases.—Unfortunately, however, we can go much farther. The insane mother will bring to the world a feeble-minded child. An innocent babe will die of a horrible disease inherited from its father. The burglar will rear a youthful pickpocket. On the other hand, we may see a learned father enrich the world with a studious son. A robust woman often brings up a healthy babe. Truly it is a "visiting the iniquities of the fathers upon the children until the third and fourth generations." There is no object in knowing about heredity unless we make proper application of our knowledge. The responsibility of bringing into the world a healthy, wise and moral generation rests on the fathers and mothers of the land. A proper appreciation of this would prevent much of the disease and misery that exists in the world.

NATURE'S GIFT OF INSTINCT.

When we glance about Nature's garden we see it inhabited by numerous creatures, each with certain gifts, and each knowing how to use them.

Bird Instinct.—As Chadbourne says: Has the bird a gland for the secretion of oil? She knows instinctively how to press the oil from the gland and apply it to the feather.

Snake Instinct.—Has the rattlesnake the grooved tooth and gland of poison? He knows without instruction how to make both structure and function most effective against his enemies.

Silk-Worm.—Has the silk-worm the function of secreting the fluid silk? At the proper time she winds the cocoon such as she has never seen, as thousands before have done; and thus, without instruction, pattern or experience, forms a safe abode for herself in the period of transformation.

Hawk.—Has the hawk talons? She knows by instinct how to wield them effectively against the helpless young.

Wonders of Instinct.—Most wonderful of all, however, is the way in which every animal seems to know the method best adapted for its reproduction. The question is often asked, Why do the dumb animals do all these things? Is it because they have some prophetic inkling of what will be the result of their action, or do they only do so because to them it seems the natural thing to do?

Instinct of the Hen.—Does the hen, for example, sit for three long weeks on such an uninteresting object as a nestful of eggs because she knows that at the end of that time a brood of chicks will step from the eggs? Or is it because to her a nestful of eggs is the most fascinating and precious object in the world?

Do bees follow their queen, and protect her, and care for her, because they are aware that without her the hive would become extinct? Or is it because the odor or the aspect of their queen is manifestly agreeable to the bees, that they love her so?

James, the great psychologist, is of the opinion that to the animal which obeys it, every impulse and every step of every instinct shines with its own sufficient light, and seems at the moment the only eternally right and proper thing to do. It is done for its own sake exclusively.

The Fly.—"What voluptuous thrill may not shake a fly when she at last discovers the one particular leaf, or carrion, or bit of dung, that out of all the world can stimulate her ovipositor to its discharge? Does not the discharge, then, seem to her the fitting thing? And need she care or know anything about the future maggot and its food?" It certainly is a curious fact that an insect should always lay her eggs in a spot just fitted for the nourishment of her young. But it is no more marvelous than the fact that every animal pairs with a mate capable of bearing posterity, or feeds on material capable of affording him nourishment.

When the burying beetle perceives carrion she is not only impelled to approach it and lodge her eggs in it, but also to go through the movements requisite for burying it. In the same way a bird who sees his hen bird is impelled to caress her, to strut around her, dance before her, or in some other way to woo her.

The Bee.—The tailor-bee, when the eggs are ripe within her, cuts out pieces of rose-leaf, bends them and carries them into a caterpillar- or mouse-hole in trees or in the earth. She then covers their seams again with other pieces, and so makes a thimble-shaped case. This she fills with honey and lays an egg in it.

INSTINCT ARRESTED BY HABIT.

It is curious how a normal instinct can be changed by a habit an animal may acquire.

Tame Animals Become Wild.—The farmers in the Adirondack wilderness say that it is a very serious matter if a cow wanders off and calves in the woods and is not found for a week or more. The calf, by that time, is as wild and almost as fleet as a deer, and hard to capture without violence. But calves born in the stable rarely show any particular wildness to the men who have been in contact with them during the first days of their life.

How Habits Affect Chickens.—Chickens may also show opposite instincts, depending on their early habits. If a chick is born in the absence of a hen it will follow any moving object, and when guided by sight alone they seem to have no more disposition to follow a hen than to follow a duck or a human being. When they have been brought up with a hen from the first, however, they will run away from a human being and follow only the hen.

Change of a Mother's Instinct.—The instincts of a mother may be changed by her first experiences. Mr. Romanes speaks of hens who had hatched ducks for three years. At last they hatched broods of chicks. Not understanding their new progeny they strove to coax or to compel them to enter the water, and seemed much perplexed at their unwillingness.

THE OBJECTS OF MARRIAGE.

Reproduction.—Birds and beasts mate for a longer or shorter period, mainly for the rearing of their young and the continuance of their kind. Human beings, however, live so long, propagate so slowly and require for their children for so many years such great parental care that permanent marriages become very important.

Division of Labor.—Man is given the duty of providing the means of support, of defense against enemies, of leaving home in wars to defend his tribe or country. To women is left the duty of caring for the household and the family, and such lighter labors as are suitable to her strength.

The Founding of a Home.—As civilization has advanced and wealth increased man desires comfort, culture, peace and happiness. A home must, therefore, be founded, free from the intrusions of the world, where men and women may share together the fruits of their industry, and gain strength for the struggle for existence.

Companionship.—Companionship with those who have the same sympathies, hopes and aspirations is another object of marriage.

It is not a pleasant thing to go through the world without sympathy, and to meet only those who have no interest in us except to make us contributors to their welfare and their selfish ends.

The Gratification of Love.—Love is the highest sentiment of the human heart. Its gratification is the most essential object of marriage. All human hearts have somewhere and sometime a desire to love and be loved. A loveless life is a stained life. The love between a man and woman in a perfect marriage is divine.

The Perpetuity of the State.—The state has its root in marriage. If we would have the state prosper, most of its sound and healthy members must be married.

LOVE THE BASIS OF MARRIAGE.

Real Love.—The basis of all true marriage is love. Love must not, however, be mistaken for sentiment, for admiration, for an idle fancy. It is more than all these. It goes to the very core of the being; while the others are superficial, transparent, fleeting.

Adaptation.—In order that there may be love there must be adaptation.

The parties must have similar tastes, aspirations, hopes and desires.

One must not be a devotee and the other an infidel.

One must not love tobacco and another hate it.

One must not be an advocate of temperance and the other of drinking.

One must not be highly educated and the other an ignoramus, with no love for knowledge and wisdom.

Extremes of belief do not go well together.

It is not necessary that the wedded pair be alike in all things.

One may love art and the other care nothing for it.

One may be a musician, the other a microscopist, and yet perfect harmony exist, if each respects the tastes of the other as much as his or her own.

Indeed it is far better that differences like these should exist, otherwise there might be too much monotony in their lives, too much sameness and devotion to one special line of thought and work.

These differences give a zest to love, and make it broader and grander.

The dissimilarities should be such as will increase love rather than diminish it.

TEMPERAMENTS.

Definition.—By "temperament" we mean a state of the body with respect to the predominance of any single quality.

Nervous Temperament.—If in a person the brain and nervous system predominate, we speak of his having the nervous temperament.

Motive Temperament.—If the bony and muscular structures predominate, we speak of his having the motive temperament.

Vital Temperament.—If the vital organs predominate, we say that he has a vital temperament.

Blended Temperaments.—These three temperaments are always combined in every individual, but in varying proportions. Sometimes they are harmoniously blended, and then we speak of the harmonious balance of temperaments. Sometimes one temperament is excessively developed and the others deficiently. Sometimes two predominate and one is deficient. Sometimes none is well developed and then we have stupidity and feebleness.

Character.—According as one or the other temperament is developed so is the character. If the brain is in excess it will influence the life and mould the nature. The person then will be fond of brain work, and less fond of muscular labor. If the muscles are in excess, he will be fond of motion, of something that requires physical exertion. If all of the temperaments are developed, he will like variety to call all his powers into exercise.

TEMPERAMENTAL ADAPTATION.

Knowledge of Temperaments.—The value of a knowledge of the temperaments in deciding the question of marriage is very great. Not only the happiness of the parties involved, but also the symmetry, mental balance and well-being of offspring.

Balancing Temperaments.—The point to be aimed at is a proper balance in all the temperamental elements. What is lacking in the one should be made up in the other, the one being a complement or counterpoise of the other, so that an even development, as nearly as possible, may be transmitted to offspring.

Marriage of Blood Relatives.—Dr. Jacques thinks it probable that the occasional disastrous effects upon the offspring of the marriage of blood relatives are mainly, if not wholly, referable to the similarity of constitution inherited by each from the common stock.

The Vital Temperament Essential.—The vital system is the life-giving and life-sustaining element in the human constitution, and must be considered as the physical basis of marriage and parentage.

This temperament should, therefore, be strongly indicated in one, at least, of the parties to a union. If strikingly deficient in one it should predominate in the other, to insure a proper balance of offspring.

A man with an excess of the mental temperament and deficient in vital stamina should either remain single or marry a woman with an immense fund of vitality, but sufficiently intellectual to appreciate him, share, in a degree, his aspirations, and sympathize with him in his tastes.

If he were to marry a woman of the mental temperament and of low vitality, the children, if any, would probably be few and puny, and die young.

THE IMPROVEMENT OF THE HUMAN RACE BY CAREFUL SELECTION.

Dr. T. L. Nichols says on this subject: "Men, like animals, or, if Darwinians prefer, like other animals, can be improved in health, in intelligence and morality by judicious breeding."

In the human race there is a process of natural selection favorable to the improvement of the race, but it is interfered with by other influences—money, caste and other social considerations. Choice is in this way restricted.

Things Which Resist Proper Choice.—A rich husband is preferred to a handsome, or healthy, or clever one.

A large dowry may induce a man to put up with a scrofulous wife.

A consumptive young lady may have a good connection.

An exhausted, broken-down roué may have a title or an estate.

We know what people mean by "a good match." It never means health, or beauty, or intellect. It may not mean good morals or disposition. And yet the form of a nose may descend through twenty generations—and if so, the form of the brain, and all the qualities of man or woman.

It is said that the sins of parents are visited upon their children to the third or fourth generation.

We know that form and color last much longer.

Seriousness of Marriage.—Seriously, people who think of getting married ought to think a little more about it. There are persons who ought not to marry. There are persons who would be criminal if they handed down to posterity the physical, mental or moral results of a bad organization or of their vicious demoralization. Our most careful scientists tell us that drunkenness is hereditary; that many crimes are hereditary; that madness, murder and suicide are hereditary.

Marriage for Posterity.—Our criminal population is composed of the children of criminals. The prisons are filled with a criminal race as the workhouses are filled with a race of paupers.

Change of conditions, no doubt, may redeem such a race, but it would be safer to discourage its perpetuation. Men and women marry for themselves when they should marry for their posterity. The greatest gratitude a man can owe to his grandfather is for giving him a good, wise, healthy grandmother, and vice versa.

HEALTH A REQUISITE IN MARRIAGE.

Marriage should be consummated only between healthy persons. Perfect health, of course, is rarely found.

The standard, however, must be held as high as is consistent with reason, trusting that future generations will raise it higher still, so that eventually the day will come when public sentiment will not permit any to marry who are not in good health.

Invalids Should not Marry.—Invalids should not marry. Not having the strength to make their own way in the world, their lives will be lives of privation and suffering. If they rear children, these will be likely to inherit their diseases and become burdens on the public.

Avoiding Tendencies.—Two persons with even a slight tendency to the same diseases, either inherited or acquired, should not intermarry, even if both are in good health at the time. If they do, they may entail a curse on their offspring, who will be quite sure to inherit their diseased tendencies. If two persons, both descended from parents with insanity in their blood, marry, they do a wrong, which is unpardonable.

How Sickly Children May Come.—Healthy persons physiologically married often rear sickly children. In many cases the reason is that their own habits are not physiological. They go to excess in labor, in food and drink, in passional indulgence. They waste life's forces instead of husbanding them. They are on the retrograde, instead of maintaining their physical integrity. They throw away their advantages, and are surpassed by the physically inferior but more wise and prudent.

Effects of Intemperance..—Intemperance is evidently a frequent cause of disease in offspring. Dr. Elam states that on the removal of the duty on spirits in Norway, the increased consumption of liquor added 50 per cent. to the insanity of the country, and 150 per cent. to the congenital idiocy.

Dr. Lannurien, at the head of an institution for mental diseases, attributes a large majority of the cases of idiocy which have come under his observation to intoxication and intemperance on the part of parents.

THE BEST AGE FOR PARENTAGE.

It is a curious fact that the largest number of imbecile children are born of very young or very old parents; that is, of those whose bodies and minds are not yet matured, or of those who are worn out and exhausted in their physiological capacity. It is also equally true that the most capable children are born of parents in the prime of life, when the physical and intellectual powers are at their best.

CHILDREN.

Children are a direct means of the highest happiness to parents.

They are also a means of improvement.

Making provision for the future of children is a powerful means of restraining the parents from extravagance and recklessness in the conduct of life.

Many a man and woman is prevented from evil courses by the thought of how their children will be injured by it.

But because children are a desirable and a positive addition to the happiness of their parents, it does not follow that all children are desirable without the slightest regard to quality.

Good children are a good and not an evil, but bad children are an evil and not a good.

What is wanted is more good children and fewer bad ones.

A Good Child.—By a good child is not meant one which will become good and learned, and make a name and fame in the world. Rather is meant one that is healthy and happy, and will shed light and sunshine on its path, and however humble, fulfill in a satisfactory way the plain, homely duties of life, as well as the higher ones.

Rights of Children.—A child is entitled to a birth with as few defects of character and constitution as it is possible to give to it. Parents are bound by honor and by their own self-interest, if they bring children into the world, to do it under such circumstances and conditions that their offspring may live healthy, happy, useful lives. To bring children into the world which will be incapable, criminal or so diseased that their whole lives can be only miserable is wrong, if not a crime. We want to increase the amount of happiness in the world and decrease the amount of misery.

HUMAN SCIENCE, OR DESCRIPTIVE MENTALITY, IN ITS BEARINGS ON HEALTH, FORTUNE AND HAPPINESS.

PHRENOLOGY, PHYSIOGNOMY AND PALMISTRY; OR, THE ART OF READING THE HEAD, THE FACE AND THE HAND.

"The greatest truth may lie in smallest things,
The greatest good in what we most despise,
The greatest light may break from darkest skies,
The greatest chord from e'en the weakest strings."

"If any science, art or work has for its beginning, its object and its end the improvement of humanity and the advancement of the race, then that work, art or science deserves the encouragement and recognition that is its due."—Cheira. There is more in this science than may at first sight appear.

Phrenology.—We know that certain bumps upon the head indicate certain characteristics of human nature.

Physiognomy.—The color of the hair and eyes, the form of the mouth, of the chin and nose, the shape of the ears, afford certain and infallible indications of temperament.

Palmistry.—The shape of the hand and fingers relates to the hereditary influence of character and disposition; the lines and markings of the palm to the events of past, present and future.

OBJECT OF HUMAN SCIENCE.

"Know thyself" was the grand motto of the ancients.

It is still the watchword of a modern and progressive world.

By the knowledge of self we may master self, and by the improvement of self we may also improve mankind.

Mentality.—Mentality is the ultimate aim and goal of men and of all things on earth. Mental science, therefore, constitutes the embodied summary of all science.

Uses of the Science.—It is the purpose of this article to give the latest results of the researches of scientists in the subjects of phrenology, physiognomy and palmistry. Only by the study of these great subjects can we thoroughly know ourselves. Without it we can never understand the natures of our children. Ignorance of it means ignorance of mankind.

Opponents of Human Science.—Ignorance is the father of opposition. No new discoveries were ever made that did not meet with opposition, and this opposition was strongest in those that knew the least about the new discovery. Columbus was bitterly persecuted for daring to suggest that the earth was round. Galileo took his opponents to the famous tower of Pisa and let fall at the same moment from its top two weights, a small and a large. Although these men saw both weights reach the ground at the same instant they refused to believe their eyes, and held fast to the old Aristotelian theory that the heaviest of two bodies would always drop to the ground first.

Opposition Without Weight.—The men who are the first to oppose a new science are those who are learned in another science, and because they are known to be wise, their opinion has great weight, although they may have devoted no study at all to the new science. Physicians, especially, are treated in this unreasonable way by the ordinary populace.

Readings of Character.—A man sees, perhaps, a strange experiment in hypnotism or he may have his character accurately read from his head, his face or his hand. He goes to his physician, and because that physician, who probably has never devoted five minutes' study to any of these subjects, pronounces such things impossible; the patient also refuses to believe in them. So he goes away and tells his acquaintances to pooh-pooh the idea, because Dr. So-and-so does not believe in it.

Human Mysteries.—It is recognized by all physicians that there are hundreds of mysteries in medicine as yet unfathomed. How much more is this so in regard to the mysteries of life and nature, which few have penetrated?

Growth of Hypnotism.—Not more than twenty years ago almost every physician declared that hypnotism was impossible. To-day the medical profession recognizes hypnotism as one of its most important studies.

Importance of Palmistry.—For years doctors ridiculed palmistry. To-day they admit that diseases are indicated in a marvelous manner by the hand. Almost all medical men admit now that the different formations of nails indicate different diseases, and that it is possible from the nails alone to predict that the subject will suffer from heart disease, paralysis, consumption, and so on. So it is with physiognomy.

Detecting Ailment.—A disease often has what physicians call its facies, an expression by which the trained eye can detect the character of the ailment.

Cheira says: "I respect doctors as a body of educated men; but I do not respect the idea that they should be the appointed judges of such matters as telepathy, mesmerism, clairvoyance, and so on, without any other qualification but that of having M. D. to their names."

What Doctors Can Tell.—How a doctor treats his patient and the way a phrenologist or palmist treats his client.

In the first place a doctor has a recognized science to go by. He has the experience of thousands of years back of him. Scientific instruments of precision and the most modern improvements are at his command. Yet how many can tell the patient what he is suffering from, unless the patient first tells the doctor all about himself and his symptoms? Even then the physician must often listen and feel and pound before he will express an opinion. And after all that, how often can the doctor arrive at a correct diagnosis? If the doctor makes a mistake, not much is thought of it, as we are all human and no man is infallible and no science is perfect.

What Phrenologists and Palmists Can Tell.—In the case of a phrenologist or palmist, however, the client, without giving his name, without telling his occupation, or whether married or single, simply exhibits his head or holds out his hands. The phrenologist or palmist then has to tell him past events in his life, present surroundings, health, past and present. Having, by accuracy only, gained the client's confidence, he proceeds to read the future from the same materials that he has told the past.

Now, if the palmist or phrenologist should make one mistake he is immediately considered by his client to be a charlatan and a fraud, and the science of mentality is regarded as a delusion and a snare.

Having, we hope, convinced our readers that it will be to their advantage to consider the subject of descriptive mentality we will now take up in detail each of its departments.

PHRENOLOGY.

Organ of Love of Young.—Let the reader feel along the middle line, at the back part of the head, toward the base of the skull, and he will recognize a small bony projection. Below this point lies the organ of amativeness. Immediately above it, and on each side of the middle line of the head, lies the organ of the love of young, forming, generally, a single protuberance occupying both sides of the line. When very large it gives to the back of the head a dropping, overhanging appearance.

Development of the Organ.—Some people are very fond of children and others cannot abide them. Some abhor even their good-natured prattle, while others show toward them the utmost forbearance, and soothe their fretfulness with admirable patience and gentleness. Now, in all these cases, the strong manifestation of the feeling is accompanied by a large development of the organ, and a feeble manifestation of the faculty by a small development of the organ, the manifestation and the development being proportional.

Principles of Phrenology.—Gall established the following principles:

1. That the mental faculties are innate.

2. That the brain is the organ of mind.

3. That the form and size of the brain are distinguishable by the form and size of the head or skull.

4. That the mind possesses distinct faculties, and that the brain is composed of distinct organs, and that each mental faculty is manifested through a distinct organ of the brain.

5. That the size of each organ can be estimated during life; and that size, other things being equal, is the measure of power.

6. That each organ, when predominantly active, impresses the body with certain uniform attitudes and movements, called its natural language.

Grouping of the Organs.—The first division of the faculties of the mind and the organs of the brain is into three grand classes:

1. The propensities of animal organs;
2. The intellectual faculties; and
3. The moral or spiritual sentiments.

Location of the Groups.—These groups are so placed that the location of each indicates its work in the graded scale of functions.

Propensities.—The propensities are placed next to the spinal column, in the base of the brain and in close connection with the body.

Intellect.—Rising above these we come to the region of intellect.

Morality.—Above that, in the very top of the head, are the moral or spiritual sentiments, through which we are brought into relation with God.

Function of the Propensities.—The propensities give force and efficiency in all our actions; adapt us to our fellows, and lead us to take care of ourselves.

Function of the Intellectual Faculties.—The intellectual faculties enable us to obtain knowledge of men and things; to compare and arrange facts; and to invent and construct what we need for the practical application of our knowledge.

Function of the Moral Sentiments.—The moral or spiritual sentiments are meant to control all the rest by subjecting them to the tribunals of kindness, justice and the Divine Law.

Classes Divided Into Groups.—The grand classes of faculties and organs are divided into groups as follows:

Propensities.—1. The social group. 2. The selfish group.

Intellectual Faculties.—1. Group of the external senses. 2. The perceptive group. 3. The reflective group. 4. The literary group.

Moral Sentiments.—1. The selfish group. 2. The semi-intellectual group. 3. The religious group.

Social Group.—The social group has for its collective function the manifestation of those affections which connect us with country and home, and attach us to relatives, conjugal companions, family and friends.

Selfish Group.—The office of the selfish group is to make proper provision for the animal wants, and to secure the preservation of life, the defense of the person and the accumulation and protection of property.

The External Senses.—The external senses have for their appropriate work the conveying to the brain of intelligence concerning the world of material things outside of the brain itself, acting, therefore, in direct coöperation with the perceptive faculties.

The Perceptive Group.—The perceptive group, through the senses, brings man into direct communication with the physical universe, gives a correct judgment of the properties of things, and leads to the practical application of the knowledge obtained.

The Reflective Group.—The function of the reflective group is to analyze, compare and classify the facts collected by the perceptives and to philosophize, contrive, invent and originate ideas.

The Literary Group.—The literary group imparts memory, and the ability to communicate ideas and feelings by means of written or spoken words.

The Group of Selfish Sentiments.—The group of selfish sentiments gives regard for character, love of distinction, self-reliance, independence, stability and perseverance. They have an aspiring and governing tendency.

The Semi-Intellectual Group.—The semi-intellectual group has for its function self-improvement, and the love and production of whatever is beautiful. It is elevating and chastening in its influences, and acts in coöperation with the strictly religious group, to which it is closely allied.

The Religious Group.—The religious group has the highest office of all, and tends to elevate man into fellowship with angels, and beget aspirations after holiness and heaven, while making him at the same time meek and humble—even as a little child—toward God. When large and active, and holding the leading place which belongs to it, all the other groups are sanctified through its action.

Division Into Organs.—Each of these groups is again divided into organs, designated by name and location on the head, and each indicative of some characteristic of the man or woman. Space will not permit a full classification and description of each organ as thus subdivided, but the general principles of phrenological science may be learned from a consideration of the organs of a single group; say, The Social Group.

Organs in the Social Group.—1. Amativeness. 2. Philoprogenitiveness (love of young). 3. Adhesiveness. 4. Inhabitiveness. 5. Continuity.

Amativeness.—"Be fruitful, and multiply, and replenish the earth, and subdue it."

Definition.—Love between the sexes; desire to marry.

Location.—Feel on the middle line toward the base of the skull, at the back part of the head, and you will feel a small, bony projection called the occipital process. Below this point and between two similar protuberances (the mastoid processes) behind the bottom of the ears lies the organ. Its size is indicated by the extension of the occipital swellings backward and inward of the mastoid processes, and downward from the occipital process.

Function.—The function or use of amativeness is to manifest sexual feeling, and give the desire to love and be loved and to marry.

Philoprogenitiveness.—"Can a woman forget her suckling child?"

Definition.—Regard for offspring, pets, and so forth.

Location.—About an inch above the occipital protuberance. When large it gives fullness to the back-head above amativeness.

Function.—To impart love for the young, and particularly for one's own children. It also leads to a fondness for pets generally. It gives a softness of manner in treating the feeble and the delicate, even in advanced life.

Friendship.—"The soul of Jonathan was knit with the soul of David, and Jonathan loved him as his own soul."

Definition.—Adhesiveness; sociability; love of society.

Location.—At the posterior edge of the parietal bone just above the lambdoidal suture. It projects at the posterior and lateral part of the head, on each side of inhabitiveness, and a little higher than philoprogenitiveness, and when very large produces two annular protuberances there.

Function.—This organ gives the instinctive tendency to attachment and delight in the return of affection. It causes one to seek company, love society and indulge friendly feelings. Those in whom it is strong feel an involuntary impulse to embrace and cling to any object which is capable of experiencing fondness. It gives ardor and a firm grasp to the shake with the hand.

Inhabitiveness.—"The Lord forbid it me, that I should give the inheritance of my fathers unto thee."

Definition.—Love of home and country.

Location.—Between parental love and continuity, on the back part of the head. Where it is very large and continuity moderate, an angle is formed near the union of the lambdoidal sutures, between which and the occipital bone there will be considerable distance.

Function.—To give love of home and country, a desire to have a permanent abode, and attachment to any place where one was born or has lived.

Continuity.—"Let every man abide in the same calling wherein he was called."

Definition.—One thing at a time; consecutiveness.

Location.—Next above inhabitiveness and below self-esteem. When large it gives a general fullness to the region; and when moderate or small, a marked depression will be perceptible.

Function.—To give connectedness to thought and feeling, and thoroughness in elaboration of ideas or the working out of the details of any plan. Concentration.

Other Organs.—Among the other organs located and functionally described, and whose location, description and function go to make up the complete system of phrenology, are combativeness, destructiveness, acquisitiveness, approbation, self-esteem, firmness, hope, spirituality, benevolence, ideality, imitation, mirthfulness, individuality, form, size, weight, order, calculation, locality, time, and so forth.

PHYSIOGNOMY.

The real science begins with Camper. He discovered the famous facial angle which, to our own time, has served as a criterion and a measure to determine the rank of the human face. Many scientists since Camper have devoted great study to physiognomy. Darwin, Mantegazza and many others have written famous works on the subject of expression.

Racial Expression.—It is interesting to note how the expression varies in different races and even in the same races. In the same races pastoral and agricultural people are less expansive in their expression; while the warlike, seafaring or trading nations have more mobile and expressive facial muscles because their life is less simple and less contemplative.

The Different Types.—Everyone knows the tranquil expression of the Oriental people, who await everything from God, and do not know the feverish activity of the Europeans.

The expression of the Frenchman is concentric, rapid and gay.

That of the Englishman haughty and stern.

That of the German heavy, benevolent and always ungraceful.

The Spaniard and Portuguese gesticulate little; their faces remain impassive.

Many Russian and Hungarian people do not look one steadily in the face, and have a very false expression.

The expression of the Scandinavian is hard and without grace.

Professional Expression.—Often on seeing a stranger we exclaim to ourselves, "This man must be a pharmacist! I bet that this is a priest or a disguised soldier! This other can only be a carpenter!" Many times these hazarded suppositions have been correct. The profession has a modifying influence on the expression of the face, and even on the character, on the health and many other inner and outer things.

The professions which most profoundly modify expression are those which daily exert a particular mode of muscular movement or of brain work. It is because of this that I recognize the druggist, the doctor, the carpenter, the priest and the soldier more readily than other members of society.

Judgments on the Face.—After looking at a human face we can nearly always formulate certain judgments relating to one of the five great problems which a human face presents.

1. Condition of health or of sickness.
2. Degree of beauty or ugliness.
3. Moral worth.
4. Intellectual worth.
5. Race.

The Healthy Look.—The healthy look is not difficult to detect. We all take great satisfaction at the sight of a picture of perfect health.

The Unhealthy Look.—The unhealthy look, on the other hand, may appear in a great variety of forms. Many times the outer aspect of the invalid, and especially of his face, suffice to make the nature of the evil guessed, and to put us on the way to a good diagnosis.

Special Functions.—There are some special functions where the particular nature of the sufferings is so faithfully inscribed on the face that it at once suggests to the observant doctor the diagnosis before any examination of the patient. The tuberculous, the asthmatic, the hypochondriacal, the cancerous have a characteristic physiognomy and expression which everyone can recognize.

The Good Face.—The two most certain signs of a good face are the permanent expression of benevolence and the absolute absence of all hypocrisy.

Never to express either hatred, or cruelty, or passion, or rancor, or envy, or luxury, or debauchery—this is enough that a face may indicate a great fund of benevolence.

The good man is happy, and he expresses his serenity, his content in loving and being loved by a perpetual smile.

Another almost constant character of the physiognomy of goodness is to be frank, open to every emotion, incapable of hiding anything.

The good man, in fact, never distrusts others; he does not feel the need of withdrawing himself from an inquisitive observation.

The Evil Face.—The habit of hatred and of all vices which debase man and reduce him to the beast, impress sadness on the face, discontent, which reveals continual displeasure and a perpetual state of war against self and against others.

The contempt, the antipathy which the wicked excite, increases in them the rancor, the secret and incessant desire for vengeance which gives to the features of their face a sad expression.

A wicked face is always false. The cheat avoids the looks of others in his invincible fear that they may read within him.

The Intelligent Face.—Large head, beautifully oval. Wide, high and prominent forehead. Eyes large rather than small. Ears small or medium and beautiful. Face small and not very muscular. Not very prominent jaws. Large and prominent chin.

The Stupid Face.—Small head or very irregular. Narrow, retreating, smooth forehead. Eyes rather small. Large and ugly ears. Large and very muscular face. Prominent jaws. Retreating and small chin.

The Amative Face.—A prominent if not massive chin; a full neck; breadth and fullness of the lips. Redness of the lips indicates present activity of the function. Absence of color indicates inactivity.

Face of Friendship.—Friendship (adhesiveness) holds fast, clings, adheres and is represented by the round muscle which surrounds the mouth and draws together or closes the lips. When this muscle is large and strong it produces slightly converging wrinkles in the red part of the lips, sometimes extending slightly into the white part.

Small perpendicular wrinkles in the red part of the lips indicate a smaller degree of friendship but not a deficiency.

The Combative Face.—There is generally a marked enlargement of the neck below the back of the side-head. Prominence of the ridge of the nose is another sign.

The Acquisitive Face.—Persons noted for their love of gain and ability to acquire property are observed to have, as a general rule, massive noses, and it is believed that thickness of the nose above the wing is the true facial sign of acquisitiveness.

Face of Firmness.—The facial sign is the perpendicular straightness or convexity and stiffness of the centre of the upper lip.

This faculty has also one of its most striking indications in the size and strength of the bones of the neck and in the perpendicularity of the neck itself.

Face of Hope.—Hope elevates the centre of the eyebrow, opens the eyes wide and turns them upward. It gives an open and pleasant expression to the whole countenance.

The Spiritual Face.—Large and active spirituality gives a singularly elevated expression of countenance.

The Face of Benevolence.—The inner extremities of the brows are elevated, sometimes causing, when strong, short horizontal wrinkles in the centre of the forehead.

Face of Mirthfulness.—Mirthfulness shows itself on the face in a graceful turning upward of the corners of the mouth.

Language Face.—A large development of language is indicated by prominent eyes. Sometimes the eyes not only project but are also depressed, when the under eyelid presents a sort of sack or roll or appears swollen.

PALMISTRY, OR LANGUAGE OF THE HAND.

Divisions.—Palmistry should really mean the study of the hand in its entirety. It is, however, divided into two sections: the twin sciences of chirognomy and chiromancy.

The first deals with the shape of the hand and fingers and relates to the hereditary influence of character and disposition.

The second deals with the lines and markings of the palm and relates to the events of past, present and future.

Chirognomy.—There are seven types of hands, each of which may again be subdivided into seven varieties. The seven types are:

1. The elementary or the lowest type.
2. The square or the useful hand.
3. The spatulate or the nervous active type.
4. The philosophic or the knotty hand.
5. The conic or the artistic type.
6. The psychic or the idealistic hand.
7. The mixed hand.

Elementary Hand.—This hand naturally belongs to the lowest type of mentality.

Description.—In appearance it is coarse and clumsy with large, thick, heavy palm, short fingers and short nails. There are also very few lines to be seen on the palm.

Interpretation.—The people possessing such a type have very little mental capacity, and what they do possess leans more to the order of the brute. They have little or no control over their passions. Love of form, color and beauty does not appeal to them.

Thumb.—The thumb of such hands is short and thick with the upper part or nail phalanx heavy, full and generally square. Such people are violent in temper, passionate but not courageous. They possess a certain low cunning, but the cunning of instinct, not reason. These people are without aspirations; they but eat, drink, sleep and die.

The Square Hand.—The square hand means the palm square at the wrist, square at the base of the fingers, and the fingers themselves square. Such a type is called the useful hand because it is found in so many walks of life. With this type the nails as well are generally short and square.

Interpretation.—People with the square hand are orderly, punctual and precise in manner, not, however, from any innate grace of nature, but more from conformity to custom and habit.

They respect authority, they love discipline. They have a place for everything and everything is kept in its place, not only in their household but in their brains.

In work they have great application, force of character and strength of will. They are sincere and true in promise, staunch in friendship, strong in principle and honest in business.

The Spatulate Hand.—The spatulate hand is so-called not only because the tip of each finger resembles the spatula that chemists use in mortars but also because the palm, instead of having the squareness of the preceding type, is unusually broad either at the wrist or at the base of the fingers. When the greater breadth of formation is at the wrist the palm of the hand becomes pointed toward the fingers. When, on the contrary, the greatest breadth is found at the base of the fingers the shape of the hand slopes back toward the wrist.

Significance.—When hard and firm the spatulate hand indicates a nature restless and excitable but full of energy of purpose and enthusiasm. When soft and flabby it denotes the restless but irritable spirit. Such a person works in fits and starts but cannot stick to anything long. The peculiar attribute that the spatulate hand has is its intense love of action, energy and independence.

As a rule it is a large hand with fairly long, well-developed fingers. The most striking characteristic of all is the singular independence of spirit that characterizes individuals possessing such a development.

No matter in what grade or position in life these spatulate hands find themselves they always in some form strike out for themselves and assert their right to possess a marked individuality of their own. It is from this hand that we get not only our great discoverers and engineers, but also the whole army of men and women we are pleased to call cranks, simply because they will not follow the rut made by the centuries of sheep that have gone before them. They will break all rules of precedent, not by any means for the sake of eccentricity, but simply because they have an original way of looking at things, and their sense of independence inclines them to resent suiting their brain to other people's ideas.

The Philosophic Hand.—This shape of hand is generally long and angular with bony fingers, developed joints and long nails. People with such a type are, as a rule, students, but of peculiar subjects. They study mankind. They like to be distinct from other people and they will go through all kinds of privation to attain this end. Such people love mystery in all things. In character they are silent and secretive. They are deep thinkers, careful over little matters, even in the use of little words. They are proud with the pride of being different from others. They rarely forget an injury but they are patient with the patience of power. They wait for opportunities and so opportunities serve them. Such hands are usually egotistical, which is in keeping with the life they lead. When in any excess of development, they are more or less fanatical in religion or mysticism. With these hands it must be bore in mind that the developed joints are the peculiar characteristic of thoughtful people, while the smooth, pointed fingers are the reverse.

The Conic Hand.—The conic hand is medium-sized, the palm slightly tapering and the fingers full at the base, and conic, or slightly pointed, at the tip or nail phalanx.

The main characteristics of the conic hand are impulse and instinct. There is a great variety in connection with this type but it is more usually found as a full, soft hand with pointed fingers and rather long nails.

Such a formation denotes an artistic, impulsive nature, but one in which love of luxury and indolence predominate.

The Psychic Hand.—The most beautiful but the most unfortunate of the seven is what is known as the psychic hand. It is in formation long, narrow and fragile looking, with slender, tapering fingers and long, almond-shaped nails. Individuals with the psychic hand have the purely visionary, idealistic nature. They appreciate the beautiful in every shape and form. They are gentle in manner, quiet in temper. They are confiding and they instinctively trust anyone who is kind to them.

They have no idea of how to be practical, business-like or logical. They have no conception of order, punctuality or discipline. They are easily influenced by others.

Color appeals to this nature in the highest possible way.

This type is unconsciously a religious one. It feels what is true but has not the power to seek truth.

These individuals have the intuitive faculties highly developed.

The Mixed Hand.—The mixed hand is so-called because the hand cannot be classed as square or spatulate, and so forth; the fingers also belong to different types.

The mixed hand is the hand of ideas, of versatility and generally of changeability of purpose. A man with such a hand is adaptable to both people and circumstances, clever but erratic in the application of his talents.

He will be brilliant in conversation be the subject science, art or gossip. He may play some instrument fairly well, may paint a little, and so on. But rarely will he be great.

When, however, a strong line of head rules the hand, he will, of all his talents, choose the best and add to it the brilliancy and versatility of the others.

Such hands find their greatest scope in work requiring diplomacy and tact.

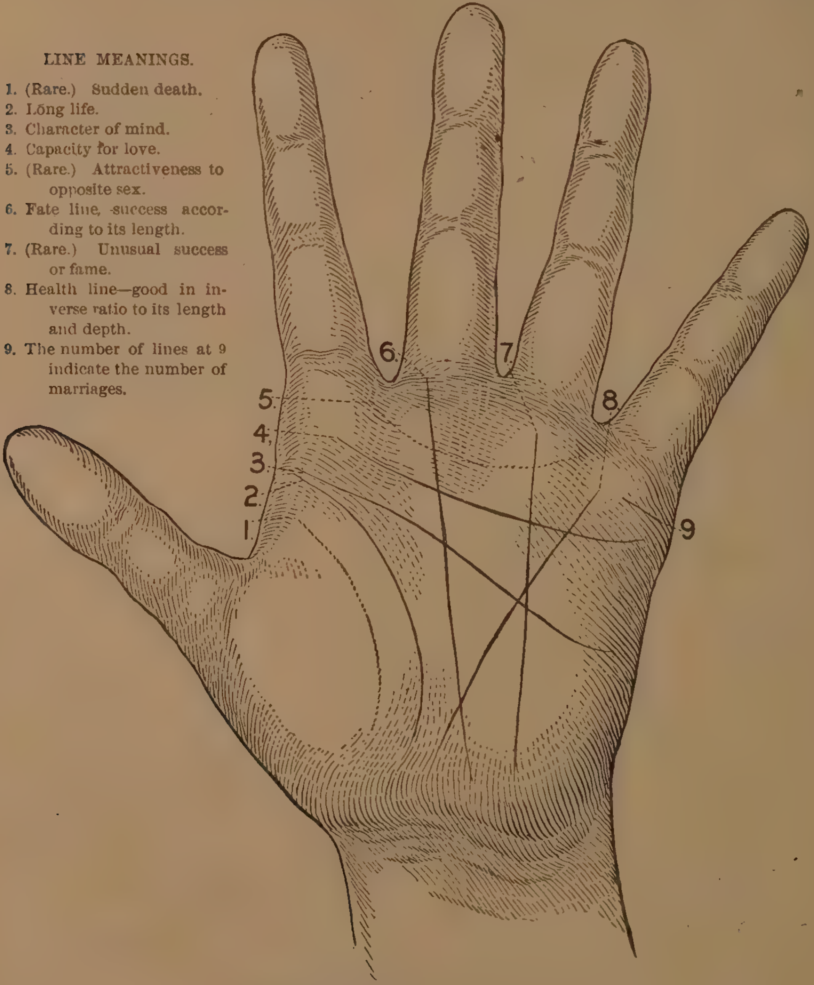
They are so versatile that they have no difficulty in getting on with the different dispositions with which they come in contact.

Their most striking peculiarity is their adaptability to circumstances. They never feel the ups and downs of fortune like others. Almost all classes of work are easy to them.

They are generally inventive, particularly if they can thereby relieve themselves of labor. They are restless and do not remain long in any town or place. As they are always changing and unstable as water, they rarely succeed.

The Thumb.—The long, well-formed thumb denotes strength of intellectual will. The short, thick thumb brute force and obstinacy. The small, weak thumb, weakness of will and want of energy.

The Fingers.—Long fingers give love of detail in everything. Short fingers are quick and impulsive. They cannot be troubled about little things. They take everything *en masse.* They generally jump at conclusions too hastily. They do not care so much about appearances or for the conventionalities of society. They are quick in thought and hasty



LINE MEANINGS.

1. (Rare.) Sudden death.
2. Long life.
3. Character of mind.
4. Capacity for love.
5. (Rare.) Attractiveness to opposite sex.
6. Fate line, success according to its length.
7. (Rare.) Unusual success or fame.
8. Health line—good in inverse ratio to its length and depth.
9. The number of lines at 9 indicate the number of marriages.

CHARACTER LINES OF THE HAND.

and outspoken in speech. Fingers thick and clumsy as well as short are more or less cruel and selfish.

When the fingers are stiff and curved inward, or naturally contracted, they denote an excess of caution and reserve and very often indicate a cowardly spirit.

When they are very supple and bend back like an arch they tell of a nature charming in company, affable and clever, but curious and inquisitive.

The Palm.—A thin, hard, dry palm indicates timidity and a nervous, worrying, troubled nature.

A very thick palm, full and soft, shows sensuality of disposition.

When the palm is firm and elastic and in proportion to the fingers it indicates evenness of mind, energy and quickness of intellect.

When not very thick, but soft and flabby, it denotes indolence, love of luxury and a tendency toward sensuality.

Lines of the Hand.—There are seven important lines on the hand and seven lesser lines. The important lines are:

The Line of Life, which embraces the Mount of Venus.

The Line of Head, which crosses the centre of the hand.

The Line of Heart, which runs parallel to the above, at the base of the fingers.

The Girdle of Venus, found above the line of heart and generally encircling the Mounts of Saturn and the Sun.

The Line of Health, which runs from the Mount of Mercury down the hand.

The Line of Sun, which rises generally on the Plain of Mars and ascends the hand to the Mount of the Sun.

The Line of Fate, which occupies the centre of the hand from the wrist to the Mount of Saturn.

The seven lesser lines are:

The Line of Mars, which rises on the Mount of Mars and runs within the Line of Life.

The Via Lascina, which lies parallel to and outside of the Line of Health.

The Line of Intuition, which extends like a semi-circle from Mercury to Luna.

The Line of Marriage, the horizontal line on the Mount of Mercury.

The three bracelets found on the wrist.

GERMAN HOME MEDICAL TREATMENT.

The Kneipp Cure.—Natural healing has been developed in Germany mainly by Priessnitz, Schroth, Kneipp, Kuhne, Bilz and others, a feature common to all their cures being the extended application of water. Especially the Kneipp cure has found in recent years a great many friends; it is called after Sebastian Kneipp, who, as a Catholic priest in Woerishofen in Southern Germany, treated and cured an enormous number of patients who called on him from all parts of the world. He died in 1897.

Principles of the Kneipp Cure.—The principal remedy is cold water. Regarding its judicious application the following general rules may be given:

1. The shorter the bath or the application of water, the better the result.

2. The colder the water, the shorter must be the bath and the quicker results the wholesome reaction in the body. Weak persons ought to begin, however, with mild temperatures, say, first 60 degrees (Fahrenheit), later 55 to 50 degrees and finally cold water.

3. Before the application of the cold water is made the body should be as warm as possible; otherwise one must begin with a warm water treatment.

4. When the application of the water has been made, do not dry the body, but dress yourself quickly and make first quick movements and then slower ones, in order to produce the reaction in the body. Should the reaction not set in and the patient be very weak, he should go to bed to get warm.

5. Hardening the body is the best means against all diseases. Nothing is better for this purpose than cold water.

Kneipp Knee Shower-bath.—With a hose sprinkle cold water on the leg of the patient, from the foot to the knee. Begin with the front of the leg; start with the right foot; go up to the knee and then back to the right foot; go then over to the left foot, up to left knee and back; do this until the legs become red. Then turn the patient and treat in the same way the back part of the legs.

The knee shower is applied mainly against rush of blood to the head; to make the blood circulate from the head to the lower parts of the body.

The Kneipp Head Shower-bath.—The whole head is uniformly sprinkled over with water by means of a sprinkling can; one sprinkling can full of water is sufficient. For weak persons take the can only one-half

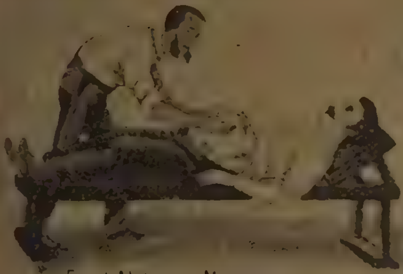


Fig 1 Abdomen Massage

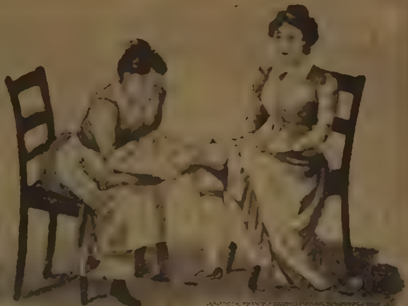


Fig.2 Kneading Lower Part of the thigh

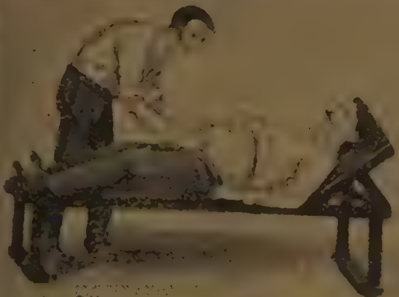


Fig 3. Kneading and rubbing of the Abdomen

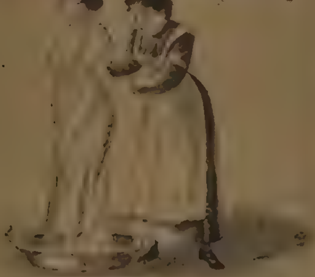


Fig 4 Down rubbing

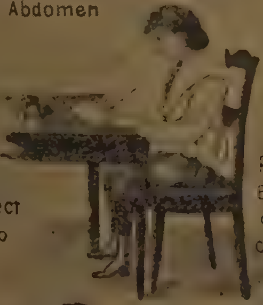
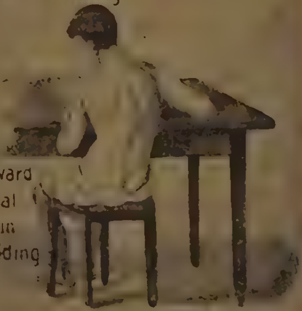


Fig 5 The Correct Position to Write



Right-sided outward Bend of the spinal cord through in correct body holding of the Writer.

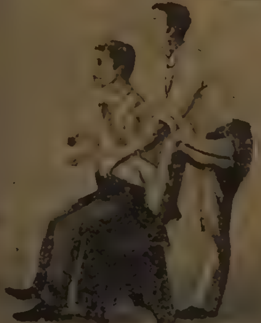


Fig 7 Breast gymnastic for Asthma (arms down)

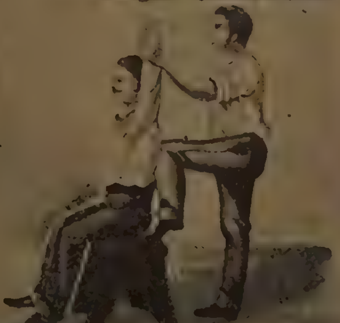


Fig 8 Breast gymnastic for Asthma (arms up)

full. The head shower-bath is applied with success, especially against diseases of the eyes, ears, nose and head. Take care to dry the hair carefully after the bath.

Walk Barefoot in the Damp Grass.—Besides the regular baths of the whole body or of parts of the body, this is the most simple and natural means of hardening the body. Persons who suffer with rush of blood to the head or with diseases of eyes, ears, throat and nose, ought to walk daily barefoot in the damp grass for ten to twenty minutes with excellent success if the weather is not too cold.

Natural Healing in Special Diseases.—Special applications of the Kneipp cure in different cases will be found in the following articles on special diseases, in which also the methods of treatment of other German representatives of natural healing are considered.

CHICKEN-POX.

Treatment.—Keep the body warm, take good care of the skin by taking daily a full or three-quarter full bed steam bath (see the description below). After the bed steam bath take a bath of 86 degrees Fahrenheit, or rub the whole body with water of 72 degrees. The inflamed portions of the skin may be powdered now and then with rice-flour. Avoid stimulating food, go much into the fresh air, and if necessary use a syringe when bowels are constipated.

The Bed Steam Bath.—This bath may be taken in two forms: either as a full bath or as a three-quarter bath. In the full bath the body is wrapped up to the chin, in the three-quarter bath the arms are free. The method of wrapping up the body is the same in both cases. The wraps are a woolen blanket, and a damp linen cloth, which has been put into water between 64 and 77 degrees and has then been wrung out. The woolen blanket must be larger than the damp linen cloth. Put the woolen blanket first into the bed on the mattress, put the damp linen cloth above the blanket, put the entirely nude patient above that and then wrap him up. The patient must be covered entirely by the damp linen cloth, and this must be again wrapped up in the woolen blanket, so that at the outside there is nothing but the woolen blanket. Hot water bags may often be used to advantage in connection with this bath; four bags may be applied: one at the bend of the knee, the second at the soles of the feet, and the other two at both sides of the legs, outside of the wrapping. Sometimes the latter two bags alone are sufficient.

These baths are not only good against chicken-pox, but may be applied also in other diseases, as will be noticed in the following articles.

WORMS.

Treatment.—Avoid irritating food. The best food is bruised wheat-bread, pumpernickel, fruits, figs and carrots. Place every night, or every second night, a bandage around the abdomen at 77 degrees (see the description below), and rub the whole body in the morning with water of 55 degrees. If necessary, use a small syringe twice daily to make the bowels move; use water of 77 degrees.

Kneipp's Worm Remedy.—Kneipp recommends the following remedy against worms: Mix wermuth with twenty-five ground seeds of pumpkins, and drink this tea for several weeks, and the worms, which cannot stand the bitter tea, will soon disappear.

The Bandage Around the Abdomen.—This bandage is not only useful for the above purpose, but is somewhat like a universal remedy; it acts often in an admirable manner; it renders very good service against cold in the head, headache, toothache, loss of appetite, dizziness, etc.; it is especially useful against female ailments.

How to Apply the Bandage.—There are required for this bandage some woolen cloth or a long woolen shawl or a piece of flannel of sufficient length and width to make a bandage twice around the abdomen. There are further required two towels of coarse linen, which are put into water between 66 and 75 degrees, and are then thoroughly wrung out. These towels are placed upon the flannel or woolen bandages, which are spread out ready for use. The flannel or woolen bandages must be larger than the towels, so that the flannel or wool have to show from either side the width of two or three fingers. The bandage, fixed in this way, is then placed around the abdomen of the patient.

BRIGHT'S DISEASE.

Treatment of Acute Form.—Take daily a bed steam bath (see the description in the article on Chicken-pox), with extra bandages at the back in the neighborhood of the kidneys, also extra bandages on the heart, until perspiration takes place freely; after that take a bath of 88 to 90 degrees, and a shower-bath with the water of 81 to 84 degrees, and rub the skin thoroughly. If necessary, extra bandages of shorter duration may be made on the kidneys, around the legs, and so forth, also during the night. Patients who do not stand well the bed steam baths should be treated by mildly washing and rubbing the whole body several times daily. Avoid irritating food; don't drink much. The best to drink is milk which is not too cold; strictly avoid all alcoholic drinks. Take care that the bowels move regularly; if necessary use a syringe; go much into the fresh air. Improvement can be obtained by this treatment in one or two weeks, but sometimes it takes several months, until the urine becomes clearer and lighter and begins to flow in greater quantities.

Treatment of Chronic Form.—The chronic form develops itself from the acute form; often the patient is not aware of the development itself, until the disease is in a critical state: Take daily a bed-steam-bath, after that a bath of 88 degrees or warmer, say 61 to 63 degrees, for eight to ten minutes. Bandages may also be applied during the night. Avoid irritating food; take much sweet milk. Drink water in moderate quantities, take care that the bowels move regularly. Above all, rest in the bed.

Kneipp's Cure.—Against Bright's disease Kneipp warmly recommends lemon-juice. According to Dr. Siebert one patient ate in three months three hundred lemons, daily three or four, and the urine was free of glair. The patient was dismissed as cured. Kneipp's baths must be of course also applied in connection with the treatment.

ITCH.

Treatment.—Separate the sick person from the healthy people, because this disease is contagious. Give the patient a steam-bath of 15 to 25 minutes, and after that let him take a bath in a bath-tub at 97 to 104 degrees, for ten to fifteen minutes; rub the body thoroughly with soft soap, to which may be added some sand in order to scratch the itchy spots open. After the bath, rub soft soap thoroughly in the itchy spots (without sand) and give the patient a "dry-wrapping" (see description below) for three-quarters of an hour to an hour. Finally let the patient take a cleansing bath at 88 degrees. Repeat this treatment daily for four to five days. Let the patient change the underwear every day. One may also leave out the steam-bath and begin at once with the warm bath. One may also rub the itchy spots with kerosene before retiring in the evening; when rising in the morning let him take a bath and clean the body with soap. Repeat this treatment for three or four days.

Description of the Dry-Wrapping.—Place on the mattress a large woolen cloth and above that a large linen bed-spread, put the patient on these cloths and wrap the same around him, first the linen bed-spread and around that the woolen cloth; wrap the bed-cover (the blankets) around and tuck them in all about so that no air can come through, and the heat which is developed inside cannot escape. The patient will soon begin to perspire.

The dry-wrapping is of great value for the most chronical diseases, but may in single cases be of disadvantage. One should always observe whether a patient stands better a dry-wrapping or a bed-steam-bath (see the description of the latter in the above article on chicken-pox) and one should choose what is more advantageous to him.

CANCER.

Treatment.—The prospect of a thorough recovery of the patient is not very great. To produce relief, give the patient daily a warm bath of 59 to 61 degrees, and sprinkle softly the sick portions of the body; further avoid all irritating food, use a diet without any meat (among the original inhabitants of East Indies, who are vegetarians, and live on vegetables and fruits, the disease of cancer is entirely unknown); finally let the patient go much into the fresh air and let him sleep at open windows.

The cancerous spots of the body should often be cleaned by rinsing them with clean water or with decoctions of camomile; also soothing or exciting bandages (see the descriptions below) should be applied. During the first period of the disease let the patient take weekly three or four full steam-baths following with full-wrapping baths and baths in the bath-tub with shower-baths; or, instead of that full bed-steam-baths (see the description in the above article on chicken-pox) with following bath. Sometimes it is of advantage to apply daily warm compresses on the sick spots, which are afterward sprinkled softly with water of 81 to 86 degrees and are then covered with a compress, moistened with water of the same temperature.

Description of Soothing and Exciting Bandages.—Both bandages are applied only at special sick portions of the body, that is on the cancerous spots. An "exciting" bandage heats the sick portion of the body and dissolves and diverts the disease. It is applied in the following manner. Dip a piece of linen into cold water of 64 to 73 degrees, wring it out and place it in two, four, six or more layers on the sick spot; place above it a thick dry woolen patch which must be larger on all sides than the moist linen. This compress must be tight and well fixed so that the heat formed below it cannot escape; the compress must be larger than the sick spot on all sides by several inches. This compress is left on the sick spot for two, three, or four hours, or for the whole night; in general as long as the patient does not want it removed; it should not annoy the patient. After the compress has been removed sprinkle the sick spot with cold water.

The Soothing Bandage.—A "soothing" bandage is applied for relieving the pain. A piece of rough linen, folded up in four to eight layers is dipped into water of 77 to 86 degrees, slightly wrung out, placed on the sick portion of the body and covered with a woolen patch. This compress is mostly applied for 30 to 45 minutes and in general as long as they produce agreeable feelings to the patient.

CATARRH.

Treatment.—The first point to aim at must be to remove the special causes to which the increased separation of phlegm is due. Avoid irritating food, rub the whole body daily with water of 73 to 77 degrees, or take a bath of 88 to 91 degrees, after which the body must be thoroughly rubbed until it is dry. During the night a bandage around the abdomen (see description in the above article on worms) is to be applied. Further different forms of wrappings, bandages and bed-steam-baths are often advantageous. Keep quiet and rest. When the organs of breathing are affected, keep the body uniformly warm, and breathe mild, clean air which is not too dry. Take care that the bowels move daily. As the different forms of catarrh are produced by different causes, they must be also treated in a different way, and the treatment should always be of such a kind that it suits the special patient. The above remarks give the general rules.

CHOLERA MORBUS.

Prevention of Cholera Morbus.—In case of epidemic cholera morbus in a town, everybody must take great care to keep his body in such a condition that it cannot be affected by the disease. The best means of accomplishing this are as follows:

The Blood.—Take care that your blood is good and healthy. For this purpose breathe good, clean air. Everybody who can afford it should be daily in the fresh air for some time; in the fresh air take repeatedly deep breaths. Air thoroughly the rooms where you live and sleep. If one is confined to the house and must breathe bad air, breathe through the nose and rinse afterward mouth and nose with fresh water and strengthen the lungs in the best air which is at disposal.

Diet.—Avoid irritating food, don't eat meat, don't drink alcoholic drinks, avoid spiced and sour dishes. When one does not want to avoid meat entirely (which would be the best), one should take care at least that meat does not amount to more than one-fifth of the meals, while four-fifths are vegetables, rice, noodles, barley, Indian meal, farina, legumen, and everything in the way of potatoes. A sudden and thorough change in the custom of eating and drinking may, however, have disadvantageous consequences, hence be cautious during the change. Drink good water.

The Skin.—Before all other things take good care of the skin. Rub the whole body daily with water by means of a rough linen towel, dry the body, rub it thoroughly with a dry towel until the body is dry; begin with the legs and arms and proceed then to neck, head, chest, abdomen and the back. The clothing should not be too thick but comfortable.

The Gargle.—To strengthen the pituitary membranes, gargle daily with cold water and rinse the nose, afterward take a few drinks of water.

While eating, chew well the meals; "well chewed is half digested," is of great importance in this case. Keep the house and the rooms very clean.

The Bandage.—The life should be very regular. Keep the abdomen warm. He who thinks that he needs a woolen bandage around the abdomen should wear it not below but above the linen or cotton shirt.

The Bowels.—Take care that the bowels move regularly every day. In cases of diarrhœa, as well as of constipation, take a clyster with a syringe containing about one-fourth pint (*i. e.*, one gill) of water at 59 to 66 degrees; also apply during the night a bandage around the abdomen (see the description in the above article on worms), the water used for this purpose having a temperature of 72 degrees. (While most people and even physicians think that a clyster—injection—is only good to make the bowels move, it is a fact that one may also cure diarrhœa with it.)

Who lives according to these rules may be sure that he does the very best to prevent cholera morbus and should not be afraid. To be afraid is disadvantageous.

Treatment of Cholera Morbus.—1. Cholera morbus never attacks a healthy person unexpectedly; there are always before symptoms of the developing disease. If the symptom is a light diarrhœa, sometimes with an unpleasant feeling in the abdomen, rub the whole body at once thoroughly with water of 66 to 73 degrees (one part of the body after the other, while the body is warm), place a bandage around the abdomen (see the description in the above article on worms), and put a hot-water bag at the feet; keep the bandage on for about an hour; but if it should become hot quicker, replace it repeatedly. As soon as the feet get warm, wash them with cool water and repeat this four or five times during this hour. When the bandage has been taken from the abdomen, rub again the body with water and apply a small injection with the syringe, the water having a temperature of 68 degrees. These injections should be given especially after the bowels have moved. If this treatment does not help apply a steam-bath in a suitable form, following with cooling bath, shower-bath or rubbing of the whole body. After that massage of the body and exercises, or a good walk.

2. When the symptom of the developing disease consists in constipation apply injections with the syringe, about half a pint or one-fourth pint, with water of 73 to 90 degrees; repeat the same every hour or every second hour, if the bowels do not move; and if this is not successful give the patient a "sitz-bath" (see the description below) at 68 to 86 degrees for five to ten minutes, while the body is kept warm and a hot-water bag is placed at the feet. Don't apply this bath when the patient feels cold, nor when he has a disease of the heart or the lungs, nor when he is nervous. Avoid any irritating meals.

Description of the Sitz-Bath.—The sitz-bath may be taken in the bath-tub or any large vessel. The water may reach up to the navel. This sitz-bath is not only good in the case of cholera morbus, but may also be applied against indigestion, rush of blood to the head, diseases of the abdomen, hemorrhoids and female diseases. These baths are often very important and their success becomes often apparent after a short time only. According to the disease and to the condition of the patient, the temperature of the water may be 66 to 73 or 82 or even more; it should be taken for five to fifteen minutes and in special rare cases for twenty-five to thirty minutes. Kneading, rubbing and massage of the abdomen during the sitz-bath is often advantageous.

GONORRHEA.

Treatment.—Keep quiet and avoid irritating meals, eat dishes seasoned very mild only, avoid all alcoholic drinks, avoid meat, drink much fresh water and enjoy the fresh air; avoid all opportunities which would cause an excitation of the genitals.

Take daily a half-steam-bath or a half-bed-steam-bath (this is a bed-steam-bath as described in the article on chicken-pox, but reaching up to the navel only, three hot-water-bags, wrapped up in damp cloths, being placed at the feet), put a special damp compress, moistened with water of 73 degrees, on the genitals. Take afterward a bath of 88 degrees.

Take daily two or three sitz-baths in water of 77 degrees, for fifteen to twenty minutes. During the night place a bandage around the abdomen (see the description in the article on Worms). In case of constipation make injections with the syringe. Instead of the sitz-baths, three or four partial baths of the genitals in water of 82 to 86 degrees may be taken, each for ten to twenty minutes; perhaps also repeated washing of the genitals with water of 77 degrees. Drink much water in order to dilute the urine. If one wants to inject water of 82 degrees into the urethra, this must be done very softly by means of a small syringe with rounded (not sharp) mouth; such injections may be made several times daily, especially after having made water. In the meanwhile also soothing or exciting bandages (see the description in the article on Cancer) may be made on the genitals, with water of 73 to 77 degrees, the compress being all wrapped up in a woolen cloth. To prevent inflammation of the scrotum, or when it has become inflamed, protect it by a suspensory which is to be buckled on in a careful and suitable manner.

AGUE.

Treatment.—For cases of ague or fever-shivering, rub the patient thoroughly (dry or wet) and then give him a dry-wrapping or a bed steam-bath (see the descriptions in the articles on Itch and on Chicken-pox). When he perspires, let him take later a bath of 86 to 89 degrees. Should this treatment cause prickly-heat on the body, looking like measles or small-pox, and so forth, this should be regarded as a good sign, because in this way the morbid matter is removed from the body. To remove it thoroughly the patient should take some more bed steam-baths, or exciting bandages, as described in the article on Cancer, should be applied, in order to make him perspire moderately. A bath has to follow.

BOILS.

Treatment.—In all cases which have been caused by bad blood a "restorative cure" should be used (see the description below). Further put soothing or exciting bandages (as described in the article on Cancer) on the sick portions of the body, the wet linen being folded up in six to twelve layers and moistened with water of 72 to 100 degrees, according to the nature of the boil. This compress must be well covered with a woolen patch much larger than the boil; when the compress begins to get dry it is to be renewed. These compresses cool, dissolve the boil and suck out the morbid matter. It is further important to clean each boil thoroughly by washing and dipping out with lukewarm water.

The Restorative Cure.—This cure is not only good in the treatment of boils but should be applied generally in all chronical diseases, as the body needs to be first strengthened in general. This cure will always give good results whatever the special disease may be. A natural, not irritating diet is required: bread, vegetables, milk, anything made of milk and of eggs, oatmeal, fruits, now and then a soft-boiled egg is allowed. Meat should not be eaten in too large quantities; strong coffee, all alcoholic drinks, tobacco, spiced dishes, and so forth, are entirely forbidden. Drink mainly water, drink it often, especially before taking a walk and before retiring at night a drink of water is to be recommended; lemonade, cocoa, malt-coffee are also allowed. The diet should be moderate; when the patient begins to feel better he should not stuff at once his stomach. The patient should enjoy the fresh air as much as possible and should take good care of the skin by daily washing or rubbing once or twice the whole body with water of 82 to 95 degrees; the applications described in the article on the Kneipp Cure are also to be recommended.

CONSUMPTION.

Treatment.—The principal object to aim at is the production of a healthier and purer blood; this requires a simple, digestible, nourishing and not irritating diet and plenty of pure and fresh air. The patient should sleep at open windows and exercise the lungs by uniform and slow breathing in and out in good fresh air. The patient should not work as a tailor, seamstress or in an office, in general not in such a profession or trade where he must sit continually. As long as the disease is still in the beginning period, light work in the garden, done cautiously, renders excellent service. In cases in which the disease has already made more progress the patient should begin with washing the upper part of the body with water of 86 degrees. When he has accustomed himself to these washings he should begin to wash also the lower part of the body; for this purpose he should use water of 73 to 77 degrees. Two points are to be kept in mind: first the patient must be comfortably warm while he is washed, and should afterward take care to dress himself quick and get warm by means of motions; second, while the patient is washed he should sit still, the washing and later the drying should be done by an attendant. Who has no attendant at his disposition should not do these washings at all. When the patient feels cool and uncomfortable, or when the weather is cool and rainy the washings should not be performed. As long as the patient is strong enough he should take walks in pure and sunny air as much as possible.

COLD.

Treatment.—Any disease which might arise from a cold is best prevented by a cure producing a strong perspiration so that the interrupted activity of the pores of the skin is restored. Take a bed-steam-bath (as described in the article on Chicken-pox); a rubbing of the whole body or a bath follows. See also the remarks in the articles on the Kneipp Cure and on Ague.

DIPHTHERIA.

Treatment.—The patient is to be separated from the healthy people. The windows of the room where he rests should be open. He should be covered with one or two woolen blankets which must be aired several times daily, if possible in the sun. The floor of the room is to be cleaned daily. The following special treatment is very successful: A full bed-steam-bath (as described in the article on Chicken-pox), combined with a cool bandage around the neck, which is applied as follows: Put a towel into water of 54 to 56 degrees, wring it out moderately and place it around the neck of the patient so that it reaches up to the ears. The upper half of the bandage is not covered with a woolen cloth. The duration of the bed-steam-bath is 45 minutes to an hour. Should the patient become uneasy the wrapping is to be removed earlier. If necessary this packing is to be repeated twice or three times during twenty-four hours. Afterward the body is to be washed with water of 73 to 86 degrees. Further, the mouth is to be cleaned repeatedly by gargling; one-fifth of a lemon per glass of water. Only when the patient wants to eat give him buttermilk, apple-marmalade, fruits, oatmeal, and so forth.

DYSPEPSIA.

Treatment.—The patient should take only small quantities of easily digestible food. After any meal his body and mind should rest. Anything that is eaten should be well chewed. The best food is rice, fruits, stale rolls, and now and then a drink of water; begin first with very small quantities of water, so that the stomach can warm it, and drink gradually more and more water. Rub daily the whole body with water or take a bath, also rub repeatedly the abdomen; the sitz-bath (described in the article on Cholera Morbus) is a very good remedy in all cases of indigestion and dyspepsia.

CROUP.

Treatment.—As soon as the suspicious cough makes its appearance the patient gets a full-wrapping or three-quarter wrapping (as described in the article on Chicken-pox); the linen cloth in which he is wrapped must contain much moisture; the temperature of the water used is 82 degrees; a hot water bag, which is covered with a wet cloth, is placed at the feet; the duration of the wrapping is one and one-half hours. After that a bath of 91 degrees, while at the same time the neck is poured over with water of 59 to 73 degrees. This treatment is repeated after five or six hours. Should the condition of the patient become worse the treatment is to be repeated at once. Besides this bandages around the abdomen every two hours with a water temperature of 82 degrees, and bandages around the calves with water of 73 degrees, also every half hour soothing bandages around the neck with water of 73 degrees (as described in the article on Cancer) are to be recommended. Enjoy the fresh air by opening the windows, drink fresh water, avoid irritating food, and in case of constipation use the syringe to make the bowels move.

FELON.

Treatment.—Take often a "hand steam-bath" by holding the hand for some time over a pot filled with boiling water, the hand and pot being wrapped up in such a way that the steam cannot escape. After that, bathe the hand in lukewarm water. During the night exciting bandages around the hand (as described in the article on Cancer), with separate compresses on the sick fingers, are to be applied. Every other day, and later every third or fourth day, let the patient take a bed steam-bath (as described in the article on Chicken-pox), also with separate compresses on the sick fingers. The sick fingers should be thoroughly kept clean and care should be taken to protect them from cold.

SYPHILIS.

Treatment.—Before all other things the food for the patient should not be spicy, nor should he eat meat; further he should enjoy the fresh air as much as possible and should sleep at open windows. The patient should daily take a steam-bath of about fifteen to twenty minutes, after that he should be wrapped up, and should later take a bath of 88 degrees. Instead of that daily, a full steam-bath or a three-quarter steam-bath (as described in the article on Chicken-pox), with following bath of 86 to 88 degrees can be applied. Bad cases have been cured by this treatment, combined with a strict diet, as mentioned above. Further, let the patient take, if possible, daily, two or three sitz-baths at 73 degrees (as described in the article on Cholera Morbus), each bath for fifteen to twenty minutes. When the genitals are inflamed, separate compresses are to be applied.

In case the scrotum is inflamed, a suspensory is necessary. Points which discharge matter must be covered with wet linen, and above that a woolen patch is placed. The moist compresses are to be renewed, when necessary, day and night. The sick portions of the body get a bath twice or three times a day and must be carefully washed and kept clean; cleanliness is of the utmost importance. To strengthen the body, the rules of the restorative cure should be applied, as described in the article on boils.

GOUT.

Treatment.—Avoid any irritating food, the best is that the patient accustoms himself gradually to a vegetarian diet. He ought to drink plenty of fresh water; also the juice of lemons dissolved in water. He should enjoy the fresh air as much as possible and sleep at open windows. He should take care that the bowels move regularly very day; otherwise he should use the syringe. When a painful attack of gout occurs, soothing bandages which contain much moisture (as described in the article on Cancer) are placed around the aggrieved bones; when the bandages have been removed, wash the skin lightly with bare hands, afterward massage, first in a soft manner and gradually in a more and more effective way, then again soothing bandages. When the pain is great, the bandages should be made rather moist, so that they may be left on the skin for a longer time in order not to trouble the patient too much. During the free pauses, the patient should be brought daily to perspiration by means of a bed steam-bath of one and one-half to two hours (as described in the Article on Chicken-pox), afterward a bath in water or 88 degrees, or instead of the bath, the whole body is rubbed off with water of 73 degrees. During and after the bath massage of the painful portions of the body is to be recommended. Sun-baths have also been applied to good advantage against gout.

Description of a Sun-Bath.—This bath has a very good influence in many diseases; when the patient is nervous, it should, however, be applied only with much caution. One form of a sun-bath is as follows: On a warm summer day the patient is laid upon a mattress upon which the sun shines, but at a place where there is no breeze or air, he is covered with a light cloth only and his head is protected by a parasol. He will soon begin to perspire; he lies first on the back and then on the stomach. After he has perspired, he is sprinkled with lukewarm water on the hind part of the head, the shoulders, the breast, the back and the legs; or the whole body is rubbed off with water. For some patients it may be of advantage to use cold instead of lukewarm water.

JAUNDICE.

Treatment.—Avoid any irritating food; the best is that the patient should live for some time on a strictly vegetarian diet, vegetables, fruits, bread; no meat, fat or eggs. Much fresh air, the windows of the sleeping-room being kept open; daily two to four bandages around the abdomen, with water of 73 to 83 degrees (as described in the article on Worms), each bandage for about two or three hours. Further, the whole body should be rubbed off once or twice daily with water of 73 degrees, or instead of that a bath in water of 91 degrees. One may also apply for some time bed steam-baths (about three per week,) with following bath of 91 degrees or rubbing off of the body with water of 73 degrees. In more serious cases the rules of the restorative cure (see the article on Boils) should be considered. In case that gall-stones are present the patient must drink plenty of water. Further, when there are symptoms of inflammation, compresses should be placed near the liver, the temperature of the water being 78 to 82 degrees. These compresses are to be replaced or removed according to the wishes of the patient.

MUMPS.

Treatment.—When the swelling of the glands is due to bad blood the principle of the cure must be to help the nature in bettering the blood. Just the glands are used by nature for purifying the blood and removing morbid matter. Therefore, the activity of the glands should be supported by steam-baths, baths in the tub, wrapping, washing, and so forth; further the circulation of the blood should be regulated by suitable massage; finally the quality of the blood should be bettered by good and healthy, but not irritating food, and by fresh air at day and night.

For acute mumps the following rules of cure may be given: Daily a bed steam-bath (as described in the article on Chicken-pox), with separate compresses around the neck, for one hour or for an hour and a half, and besides extra compresses around the neck with water of 68 to 73 degrees, well covered with woolen cloth. When they become hot so that the patient feels uncomfortable (about every thirty or forty-five minutes), they are to be replaced. Afterward the whole body is rubbed off with water of 73 degrees. A vegetarian diet is to be recommended.

RHEUMATISM.

Treatment of Acute Rheumatism.—Daily a bed steam-bath (as described in the article on Chicken-pox) for one hour or an hour and a half.

Before this bed steam-bath massage (first of the sound, then of the sick portions of the body with warm hands, moistened with fresh water. After the bed steam-bath the whole body is rubbed off with water of 66 degrees, with massage of the sick portions. The latter also receive often soothing bandages (as described in the article on Cancer); when they are removed cold rubbing and massage of the sick portions with bare hands. Take care that the bowels move regularly. Apply during the night a bandage around the abdomen (as described in the article on Worms). In case the inflammation and the pain are very great it is better not to use massage in the first time.

Avoid irritating food, strictly vegetarian diet is to be most recommended. Avoid all exciting drinks, such as coffee and alcoholic drinks. Breathe fresh air in the house and outside; sleep at open windows. Drink often water and lemonade in large quantities.

SCARLET FEVER.

Treatment.—Separate the patient from the healthy people. Take care that the formation of the scurf on the skin goes on regularly so that the body is supported by the treatment in removing the morbid matter. Bandages around the middle part of the body and around the legs with water of 73 degrees (as described in the article on Cancer). When the patient has high fever, wrap up the body (as described in the article on Chicken-pox) and put a moist towel around the neck (as in the case of Diphtheria); also a bath of 86 to 91 degrees. To support the body in removing the morbid matter, apply bed steam-baths with following lukewarm baths (as described in the article on Chicken-pox). Avoid irritating food, eat much fruits, drink much fresh water, take great care not to catch cold, especially during the time the scabs fall off; but fresh air is to be brought continually to the room by opening the window. In case of constipation, apply the syringe to make the bowels move. Be careful for some time after the patient has recovered in order to prevent a relapse.

SMALL-POX.

Treatment.—Separate the patient from the healthy people. Take care to have fresh air in the room where the patient lies. Greatest cleanliness, frequent change of the underwear, daily washing of the whole body. Avoid any irritating food. Drink often fresh water, also lemonades of fruit juices. Further three-quarter or full packing (as described in the article on Chicken-pox), the water used for this purpose has a temperature of 68 to 86 degrees. Further an extra compress around the middle part of the body. This packing is made up as follows: On a mattress is placed a large woolen cloth, above that a large linen cloth which had been put into water of 68 to 86 degrees, and had been well wrung out. These two cloths are for the three-quarter or full packing. On the large linen cloth, where the middle part of the body will lie, place a large towel which has been moistened in the same water and is used as extra compress.

Put above this the patient. Wrap the towel around the middle part of his body, then the large moist linen cloth around his body, and wrap him finally up in the large woolen cloth. The duration of this packing is one hour or an hour and a half or even more, in general as long as it is comfortable to the patient. Afterward a mild washing of the whole body or a bath of 86 to 91 degrees with a following shower-bath. After this the patient is dried and brought to bed, or he is not dried, but, wet as he is, he is covered by a dry linen cloth, brought to bed and well covered with the blankets. As soon as the fever has again increased, this treatment is to be repeated. To prevent as much as possible the formation of scabs in the face, put continually compresses of 66 to 73 degrees on head and face.

WHOOPING-COUGH.

Treatment.—Separate the patient from the healthy people, as the whooping-cough is contagious. Daily one to two lukewarm (82 to 93 degrees) three-quarter bed steam baths (as described in the article on Chicken-pox), with an exciting bandage around the shoulders (as described in the article on Cancer), of a duration of one and a quarter to one and a half hours; afterward a bath of 88 to 91 degrees is given or the whole body is rubbed off with water of 73 degrees. During the night a bandage around the abdomen (as described in the article on Worms) is applied; the water used for this purpose has a temperature of 82 degrees; the bandage must be very well covered with a woolen cloth. It is also to be recommended to take a small drink of moderately cold water after every attack of cough. Fresh air day and night; the windows of the sleeping-room should be open. Vegetarian diet, in which all irritating food is avoided. Let the patient eat fruits and slimy food, such as water gruel, barley-water, and so forth; further, let him drink lemonades of fruit juices. Meat should be avoided. Change of air, or the removal of the sick child from the town where there is an epidemic of whooping-cough, is also to be recommended.

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JAPANESE CHARACTERISTICS AND THEIR VARIOUS DISEASES AND TREATMENTS.

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THE SKIN.

The skin of the Japanese is of light yellow, which on the one hand transits into an European white, while on the other hand it goes down into deep yellow or light brown. Exceptionally, it is light bronze colored as if they came from Ceylon.

Skin of Upper Classes.—The people of the upper class are mostly lighter in color than those of the lower stratum. Some Japanese are not distinguishable from Caucasians in color, and apparently lighter than many of the Spaniards or Italians. The northern Japanese people are lighter in color than those of southern Japan, where they resemble somewhat the Malayans in color. Differences between sex is very slight. It is caused by the difference of the mode of life. Japanese men are more exposed to weather and sunshine than the women, half of whose lives are lived inside of the house.

Skin of Children.—Children are not lighter than the adults, and toward their teeth-changing age they become somewhat flushed with red color.

Babies.—A new-born baby is called *akambo* in Japanese, which means "red baby." It is remarkably red compared with that of the white race, but the redness does not continue longer than a few days after birth. Babies of higher class people are also lighter in color than the lower, while in other respects infants coming from robust mothers are frequently lightly rose-colored in the cheek, and are not as beautiful as the lighter child for European eyes.

THE CAUSE OF COLOR.

Skin Pigments.—The yellow color of the skin of Oriental people depends upon the presence of pigment particles within the skin stratum.

So we find yellow or brown pigments in these people while it is black in the negro. But by careful examination of the lighter-colored skin of the Japanese there is a very small amount of pigment, though it may be larger in amount according to the intensity of the color. Of course the amount of the pigment found in Japanese differs only quantitatively, not qualitatively. In children just born, or in fœtus, the distribution is very uneven and the amount is also scarce.

Japanese Ladies—(Upper Class.)

Mixed Breeds.—Mix breeds of European and Japanese áre mostly very beautiful, their skin resembling north Europeans, or sometimes the inhabitants along Mediterranean sea.

Skin of the Abdomen.—Local pigmentation is not without interest. The pigmentation of the middle line of the abdomen is oftentimes noticed in yet young maids who have no relation to pregnancy at all, whereas European women have it only during their pregnancy. In rare cases we meet with pigmentation of male subjects.

Japanese Lady—(Middle Class.)

Nipples.—Nipples of unmarried girls are darker than those of the blonde European women, which in the latter must be gently rose-color before marriage.

Lips.—Lips and eye-balls are generally about the same as Europeans are, but sometimes there are some who have circumscribed blueish-grey coloration along the conjunction of external skin and mucous membrane.

Tatooing.—Beside these congenital characteristics, Japanese did tattooing in greater extent. But tattooing on the skin is not accepted by the higher class or educated people, it is controlled exclusively by the lower layer of the people, such as coolies or the same. Under the law these barbarous customs were already forbidden and now we see them very seldom among the old coolies.

CARE OF THE SKIN AMONG JAPANESE.

Japanese Cleanliness.—Japanese are strict lovers of individual cleanliness. Every family has a bath-room, whether in the city or the village cottage, from the wealthy to the poorer classes. Those who have no bath-rooms of their own may find everywhere public baths, which are scattered throughout the cities or towns. These public baths stand under inspection of the sanitary police.

Daily Baths.—Above the middle-class people, Japanese take baths every day; even the laborers never omit baths over three days at longest.

Change of Clothing.—Underwear, stockings or other clothes are sent once a week to laundries, while well-to-do families take more frequent care of the clothing. Japanese women are more careful than the men, so if any woman omits a bath over two days she is spoken of as dirty by the others.

Bath Temperatures.—The temperature of the bath is generally very high in the city, while it is about the same as in other lands in the country.

THE HAIR.

Types of Hair.—Speaking generally, Japanese have the same features of hair as the other folks of the Malayo-Mongolian race. There are, however, at least two kinds of Japanese distinguishable by their hair, one is of the thin hair type, with long face; another is of the thick hair type, which reminds us of resemblance of the Albino race. In this latter type we observe pretty coarse hair on various parts of the body.

THE HAIR OF THE HEAD.

Color of Hair.—Development of hair of Japanese is thick and strong. The color of the hair is seemingly dark, but absolute black is very seldom seen. If we examine the hair carefully it is darkish-brown, or frequently red-brown; true blonde hair being seen rarely in the Japanese, it being somewhat abnormal, as the hair of the Albino is among Europeans.

Hair of Children.—The hair of children is far lighter in color than that of adults. Under four years the children have rarely dark hair.

Women's Hair.—The hair of women appears a more brilliant black than that of the men. The length of the hair is preserved pretty long, for aesthetic purposes, and some reaches to the heel, when they untie their pompadours. The thickness of the hair is about equal to that of European women. Japanese women's hair is generally straight. Curling is seldom seen. Japanese women detest curled hair, and unmarried girls are quite unhappy when they have curled hair.

THE BEARD.

The beard of the Japanese is very thin and scarce. It makes its appearance comparatively later in life than with the Europeans. The color is generally dark-brown to red-brown, and sometimes lighter brown.

CARE OF THE HAIR.

Pompadours.—No woman in the world, from admirable society ladies to the negresses in a wild part of Africa; from ancient Egyptians to the present Hottentots, have failed to take care of their precious hair. So it is also the case with Japanese women. As you read and see, the Japanese women form very peculiar pompadours with great earnestness and skill.

Perfumes.—They use some perfuming oily materials to make the hair fragrant and brilliant.

Hats.—The European hat is never used by Japanese women. They use an oblong square piece of various cloth. In a short walk they use no cover except a handy parasol. On the other hand, most of the laboring class women use cloth covers over their heads.

NOSE AND EYES.

Nose Peculiarities.—One glance is enough to judge what nationality is in question, when anybody notices the nose and eyes of the Japanese. The difference of the nose of Japanese from Caucasian lies in the anatomical difference as to the attaching point of the root of the nose to the frontal bone. Where the Caucasian's stretches out directly from the same plain in front the Japanese nose starts from far deeper portion of the frontal bone. This peculiarity gives a further characteristic appearance to the face of disagreeable flatness. Exceptions to this common character are frequently seen.

The Eyes.—Japanese eyes are very different from those of the European, as the latter have the depression between the orbital arch and lid-rim, while the former lack this depression and have folds in the lid-rim and inner-angle of the eyes. The opening also is narrower in Japanese. All these differences depend upon the position of the eye-balls. The European has eye-balls situated more forward.

Color of the Eyes.—Japanese have dark eyes; among one hundred, ninety-five being brown, five black. But in Japan true black eyes are rarer than in Southern Europe. New-born infants have bluish-black to greenish-black colored eyes, which after several months become gradually a brown color.

Eyebrows generally grow very thick and broad and of black color.

Ears.—Ears are not built shapely in many cases as we notice in Europeans.

Cheek.—The cheek is also pretty prominent, which represents an Asiatic characteristic. This is only remarkable in one type of Japanese; while in another the long-faced type is not much noticeable.

MOUTH AND TEETH.

The mouth of fine type is usually small, and the lips fasten shapely; while the lower type has a comparatively wider opening, which is disagreeable to look at. Teeth are of good quality when grown normally. In the lower class, however, there is a more prognatic mouth, owing apparently to the ignorance about the proper care of the children during their second dentition. Dental diseases seem to be rarer than in this country. Oral hygiene is regarded as important by the Japanese, and children are taught to get a regular habit of cleaning the mouth at home as well as at school.

INFECTIOUS DISEASES.

Measles (Mashin or Hashika).—Preventive measures are taken strictly. Isolation of the sick children from healthy. When one of a family falls a victim, all dejecta of the sick child is mixed with antiseptica, such as five per cent. carbolic acid, or one one-thousandth corrosive sublimate lotion, and so forth. For the disease itself, baths, packs—especially carbol ointment, milk, eggs, expectorants and sometimes antipyretics.

Scarlet Fever (Shiokownetz).—Preventive measures are the same in all infectious cases. Baths, douches, packs, gargles, lemonade, stimulants and symptomatics. In Japan no epidemic of this disease has been experienced, and I have treated only one case. Some authors believe that Japanese are immune to scarlatina.

Small-Pox (Howsow).—Before the introduction of Jenner's vaccination, small-pox was regarded as if a life-tax which everybody born in Japan must pay once in a lifetime.

Vaccination.—Since vaccination has been imported people believe in it unanimously, and thirty years ago the government put forth vaccination laws. It is compulsory, every three or seven years. The treatment is by baths, symptomatics, stimulants, prophylactics.

Chicken-Pox (Futow).—Children suffer only slightly, and unless complications follow the physician is not usually called in. But medical officers of health notify the case.

Mumps (Zikasenin).—Generally mercuric ointment rubbing is enough. If the case is grave, the leech, purgatives, light diet and incision are resorted to.

Whooping-Cough (Hiakunichigai).—Isolation of children from patient. Change of air; much out-of-door life; moist packs; cold ablution. Each fit attended with vomiting should be followed immediately by the administration of nourishment (milk, egg, broth, and so forth). Bromoform from three to ten drops, sometimes beneficial. Internally, some narcotics, such as bromide or belladonna. There are many children who become true patients from imitating their comrade-patients. Parents lack care when such a comic accident occurs.

Cholera Nostra (Kakuran).—This is much dreaded by parents, and also in adults in the summer months.

Treatment.—Opium, calomel, bismuth, astringent wine, soup, poultices, stimulants.

Dysentery (Sekiri).—Japan was losing her inhabitants at a dreadful rate annually, and the cause was discovered by Dr. Shiga, who started his serum-therapy treatment about three years ago in behalf of the government. The result of this special treatment decidedly diminished the mortality. Dr. Flexulo, professor in University of Pennsylvania, discovered the same cause in his expedition to the Philippines.

General Treatment.—Besides this special treatment, castor-oil, calomel, opium, suppositories, saline infusions, mucilaginous enemata, concentrated liquid diet, stimulants, hot packs, isolation, notification, disinfection, and so forth.

Canine Rabies (Kiokenbio).—Preventive inoculation, or commonly spoken of as Pasteur's treatment. Cauterization of wound, narcotics (chloral, morphine), stimulants.

The Plague (Pest or Kokushibio).—The recent invasion of plague gave Japan a severe blow, and government as well as people were in utmost alarm, and every effort was made to subdue this obstinate disease. At present no case in Japan. The preventive measure is very strict; burning down infected places, ships and trains quarantined, house-hunting and arrests in suspicious cases.

Special Treatment.—For special treatment, Yersin's healing and preventive inoculation; Kitasato's serum therapy; Oiher's symptomatic treatments.

Yellow Fever (Ohnetz).—No cases in Japan.

The Rheumatic Diseases (Riumatisu).—Salicylic acid and its salts, salophen, salol, colchicum. Wet packs, baths (iodine, bog-mud), massage, and so forth.

Croupous Pneumonia (Haïin).—Ice-bag, cold drinks; diet with milk and eggs; cold packs, mustard-plaster, digitalis and stimulants.

Epidemic Cerebro-Spinal Meningitis (Riu-kow-sei Now-sekizuimaku-in).—Occurs seldom in Japan.

Treatment.—Rest, cold pack, ice-bag, blood-letting from mastoid region, calomel, cantharoidal blister to the nape of the neck, mercurial inunction, antipyretica and narcotica.

Erysipelas (Tandoku).—Serum therapy in first place, and then ordinary symptomatic treatments, such as poultices, sustained nourishment, cold baths, stimulants, injection of 3 per cent. carbolic acid to surrounding inflammation.

Relapsing Fever (Kaikinetz).—Quinine or other antipyretica stimulants and tonics. This disease was introduced by soldiers at the end of China-Japanese war, but no cases at present.

Malarial Fever (Kwanketsunetz).—Quinine sulphate in various doses before the expected attack—usually six hours. In protracted cases, arsenic and iron administered, and baths directed.

TUBERCULOUS DISEASES (Kekkaku-bio).

Pulmonary Tuberculosis (Hai-kekkaku).—Digestible diet (milk chiefly recommended, eggs, soft-boiled rice, cod-liver oil, young poultry), cool rubbing of skin, open-air life, country residence, treatment in sanatorium; arsenic, creosote, guayocole, myrtol, solveol, and so forth; mineral waters. Expectorants (pectoral tea, senega, apomorphine, chloride, and so forth). For cough—codeine, opium, belladonna. morphine. For night-sweats—atropine, agaricine, and so forth. For hemorrhages—rest, ergotine, morphine, ice-bag, lead acetate. For marasmic fever—antipyretics. Individual spittoon, disinfection of linens, encouragement of the patient.

Sanatorium Treatment.—Beside these ordinary treatments in Japan a special serum therapy is in popular favor, or new-tuberculin injection in sanatorium, where patients are provided with free air, sports in various styles and medical attendance.

Glandular Tuberculosis (Rui reki).—Cod-liver oil with lime, iron, iodide, arsenic, nutrition; sometimes surgical operation. Japanese believe that glandular tuberculosis is a forerunner of pulmonal tuberculosis, and they come to get it extirpated by surgeon.

Intestinal Tuberculosis (Cho kekkaku).—Opium, poultices, bismuth, astringents, mucilagenous drinks, decoction of salep or colombo.

Tuberculous Peritonitis (Fukumaku-kekkaku).—Beside symptomatic treatments, laparotomy undertaken with brilliant results.

Typhoid Fever (Chotyphus).—Serum therapy is used as a special remedy with good results. Diet, milk, broth, eggs, beef juice or chicken. Calomel at onset. Cold baths at 20 degrees Centigrade, and antipyretica in febrile stage. Later, digitalis and stimulants. Prevent bed-sores by alcoholic applications or air bed.

Diphtheria and Croup (Dixteria Croopu).—Serum therapy in every case. As other methods for preventing complications, gargle or inhalation of dilute solution of carbolic acid (rarely used), iced milk, stimulants. In suffocating stages, emetics, intubation or tracheotomy. In such grave cases combination of antitoxin serum and surgical operation are preferred.

Grippe (Riu kow sei Kanbo).—Isolation and disinfection of the patients, but in widespread epidemic these preventive measures are scarcely to be carried out. For patient, rest in bed, good ventilation, lightly digestible food and medicaments. Among medicines, chinine is very effective, or antipyrine and salicylic acid are recommended for fever. Expectorants, gargles and stimulants according to the condition of the patient.

Asiatic Cholera (Kolera).—Strict quarantine and disinfection. Cholera cadavers always cremated.

Serum therapy against cholera was and is used by government institute, but we have not many cases to determine its real value. Calomel, opium, ice-pills, hot-packs, stimulants, infusion of saline solution are symptomatic medicines.

Leprosy (Rai-bio).—Preventive measure is the most important, inasmuch as we have no special treatment. In a plain, near Mountain Fuji, there is one lepra village under government expense, where any patient who desires to spend his poor life apart from the community is allowed to live, furnished with necessary staffs.

Among medicaments for leprosy, natrium salicylicum has good reputation and ointments of ichthyol, aristol and hydroxylamin are recommended.

Gonorrhea (Rinbio).—As preventive measure, strict inspection of public girls thrice a month by sanitary inspectors. Some use condoms and wash local part with 2 per cent. carbolic acid, after intercourse.

Medicinal Treatment.—Among medicines, sulphate of zinc followed by iodoform is most used; garbolmol came in general use quite recently. Internally, balsamum copaivæ (0.6 in gelatine capsule, five ten times a day), balsamum peruvianum, balsamum tolutanum, oleum terbenthinæ, fructus cubebæ, and so forth. Dietary care is very important, as light coffee, milk, tea, avoiding strong coffee, tea or spices. Patient must be confined to bed, no speaking, no pictures which may cause sexual excitement; against erection and pollution; early supper, many hours before sleep, and a pulver consisting of bromide potash, lupulin and camphor.

For annoying urination (repeated in short time) suppositories of opium or morphine used (but not belladonna).

For chronic gonorrhea we decline to meet urethral strictures, which want bougie treatment or surgical operation.

Tetanus (Hashofu).—Serum therapy used in general. Beside thorough incision and washing of the infected wound, if discovered. Among symptomatic remedies narcotics are the only medicines to lessen patient's trouble.

Chancre (Nansei-gekan).—When ulcers appear many abortive treatments offered, such as washing with concentrated nitrate silver, sulphate zinc, caustic potash, caustic paste or galvanic cauterization.

After these methods, application of thin layer of iodoform, aristol, calomel, bismuth, dermatol or europhine, and covered with fat-free cotton moistened with carbol vaseline. Liquors avoided, as well as sexual intercourse. For complications, often surgical treatment wanted.

Syphilis (Baidoku) or Acquired Syphilis (Kowten baidoku).—Prophylaxis, being the same as gonorrhea. When syphilitic patients may marry?

It is considered as harmless if they marry after three years from their first infection. But this, of course, depends upon the patients, whether they had taken proper antisyphilitic treatment during that period or not. After marriage, they should consult physicians every two or three weeks for first six months whether any sign of return appears or not.

Syphilitic Stages.—If a man is infected with syphilis, the first symptom is hard chancre, which wants mercury treatment. From this primary stage to secondary period mercury cure is the chief treatment. The patient is forbidden to indulge in *baccho et venere* during this treatment. Cold is harmful for the patient taking inunction cure, so cold baths or douches not allowed. Dietary care is also important. Some physicians recommend combination of inunction and internal administration of iodide potash. For the broad condylomata on the external skin, washing with saline solution and calomel pulverization proves beneficial. When recidicive occurs, sometimes condylomatous eruptions appear in mouth. In such case internal use of mercuric preparation is prescribed.

Third Stage of Syphilis.—When syphilis proceeds to the third stage, iodide of potash is prescribed as a special remedy. By this treatment, if patient be persevering enough to maintain full effect, almost all of the syphilitic symptoms disappear.

Iodo preparations combined with iron serve as an effective remedy against subsequent cachexia and amyloid degeneration. Mineral baths (sulphur) are recommended also. Sometimes subcutaneous injection of mercuric preparations are directed.

If gummata affects various parts they are treated surgically.

Nose Syphilis.—When syphilis is located at nose, mercuric plaster is used for ulcerative part of skin. For the destruction of internal part of nose, we treat it with nose-douche, washing with carbolic acid (2 per cent.), corrosive sublimate or thymol, followed by snuffing of calomel or iodoform. After the destructive process ceases to progress, the deformation is repaired by a plastic operation.

Other Syphilitic Forms.—Other forms of syphilis are treated under general antisyphilitic remedies and special methods according to the location.

For syphilitic affection of nervous system, electricity or massages are recommended sometimes beside general antisyphilitic cure.

Hereditary Syphilis (Senten baidoku).—Prophylactic measures are most important, so nobody should marry within the course of three years after infected with syphilis. If a woman becomes infected with syphilis during her pregnancy, a strict antisyphilitic remedy must be taken. If it was in the course of the latter half of pregnancy, the baby is expected to be born healthy. But in such a case, the baby is to be nourished with cow-milk or by a wet-nurse exclusively. But if syphilis had rooted deep in the parent before pregnancy, the baby also inherits the formidable virus with its life, and then the baby is preferably nourished with its mother's milk. But the mother is treated with iodide potash in order that the specific medicine may be secreted through mammalian glands into the milk. For the disease itself, use mercuric pills in favorable forms for the stomach.

Treatment of Mothers.—During treatment the mother should take care of cleaning oral cavity every day. Bath containing corrosive sublimate (3.0), 28 degrees Réaumur, is directed every day. In my country the bath-tub is made of wood generally, and it suits for the use of mercury bath.

DISEASES OF RESPIRATORY ORGANS.

Laryngeal Catarrh (Kowtow katarrh).—Priesneitz's pack around neck, hot milk, codeine for acute. Inhalation of saline water, tannin-alum solution; painting with nitrate silver (3-10 per cent.) for chronic. Baths are not recommended much.

Bronchitis (Kikwanshi katarrh).—For acute form, mineral water, milk and tea, wet packing, warm baths, codeine, expectorants. For chronic form, marine life or warm southern climate, wet packs, rubbing skin, expectorants. Inhalation of mineral water is especially recommended.

Asthma (Zensoku).—Treatment of eventual nose diseases, marine life. In paroxymata, iodide potash, morphine, inhalation of pyridin vapor, and so forth.

Pulmonal Emphysemata (Haikishi).—About same as asthma or bronchial catarrh. Iodide potash or digitalis, gymnastics of lungs, pneumatic chamber, compression of thorax, and so forth.

Pleurisy (Kiomaku-irr).—If the quantity of exudate reaches up to second intercostal space soon, it is drawn by puncture. But there must be several pauses during the whole operation, as it will cause cerebral anemia from sudden loss of blood-pressure. Before and after treatment of the operation must be strictly aseptical. Besides, contra-irritation, wet pack, ice-bag, diuretics, anti-rheumatics and morphine.

DISEASES OF CIRCULATORY ORGANS.

Endocarditis (Shinzonaimakuin).—Rest, ice-bag, salicylic preparation or eventually digitalis, strophantus.

Cardiac Insufficiency (Shinzo-benmaku-heisafuzen).—Digitalis infusion (0.8—1.2/00) is the chief remedy in meeting the disturbance. Other auxiliary medicaments are diuretics, stimulants, morphine.

For the hydropsy from heart disease: Calomel combined with digitalis, taking care of stomatitis at the same time. Then the diuretics such as acetate potash, diuretics, scilla, tartarus boraxatus, and so forth.

Treatment by Massage.—Massage, high position and enveloping of the swollen parts is recommended. Puncture for strong hydropsy is rare. During compensated stage care is directed not to use strong body moving or alcoholic beverages, while patient should take nourishing, assimilable food. Bath-cure (cold baths) is also advisable.

Nervous Palpitation (Shinkeisei Shinki-kowshin).—First affair is to improve patient's general condition; iron, quinine or strengthening diet for anemic subjects, while bitter waters or bath-cure prescribed for the full-blooded. Among internal remedies nervines or sometimes narcotics are used. Cold compression and ice-bags often act beneficially.

Angina Pectoris (Kyoshinsho).—Irritation of skin (mustard), application of hot or cold compression, morphine injection and other narcotics such as chloralamid, nitro-glycerine, and so forth.

Pericarditis (Shinnow-in).—Quiet, rest, digitalis, strophantus, ice-bags or mustard-paste. In large exudate, puncture with aspirator; in pus accumulation, surgical operation.

Aneurism of Aorta (Daidowmyakuriu).—Iodide of potassium, ergotine, compression, electric cauterization, and so forth. But no remedy proves effective.

DISEASES OF DIGESTIVE ORGANS.

Inflammation of the Mouth (Konai-iu).—Including various forms of stomatitis. Cleanliness, care of gums; gargle with tannin, alum, borax, and so forth, according to the condition, antiseptics also used such as hypermanganate of potassium (0.1 per cent.), chloro-potash (2 per cent.), hydrogen dioxide solution (2 per cent.), tincture myrrh, tincture ratani, or lapis cauterization in grave cases.

Acute and Chronic Gastric Catarrh (Kuisei and Mansei-I-katarrh).—Treatment of the acute same as here. For chronic forms it depends upon the nature of the causal diseases. At first, treatment of causal diseases; regular dietary, avoiding fatty indigestible foods. Sometimes cold rubbing upon the stomach region, massage over stomach, regular evacuation (using oil or glycerine enema), sea-water baths, hot spring cures.

Gastric Ulcer (I-kwaiyo).—Bed-rest, warm poultice applied intermittently, fluid diet (milk, eggs, soups). Internally, administer sodium bicarbonate with bismuth, the latter used alone in large doses in some cases.

Cancer of the Stomach (I-gan).—Internally, only symptomatics, sometimes hydrochloric acid and extract of condurango used with good result. Eventually, when the cancer is located near the pylorus it is removed by surgical operation.

Dilatation of the Stomach (I-kakucho).—Regular washing of the stomach in evening daily; massages, electricity; cold rubbing over gastric region. Fluid diet, regular evacuation with purgatives or enema, morphine, chloral hydrate, and so forth. Surgically, early extirpation of the tumor.

Nervous Dyspepsia (Shinkeisei-shokafurio).—Cold rubbing, strengthening diet, massage, electricity, baths and mental therapy.

Intestinal Catarrh (Chokatarrh).—Dietary regulation, opium and tannin, tannigen, and so forth. For acute form, artificial Carlsbad salt, packs, massage, digestible food and regular evacuation. Alcoholic liquors forbidden.

PARASITES OF THE INTESTINES (CHOKISEICHIU).

1. Tape-Worm.—Extract filic maris 2.0 in capsules (in 5-6 pieces) taken in one-half hour. Three hours later one spoonful of castor oil given. Sometimes we use thymol, one-half grain, instead of extract filic, as the latter may eventually cause amaurosis. Chloroform is also used with success.

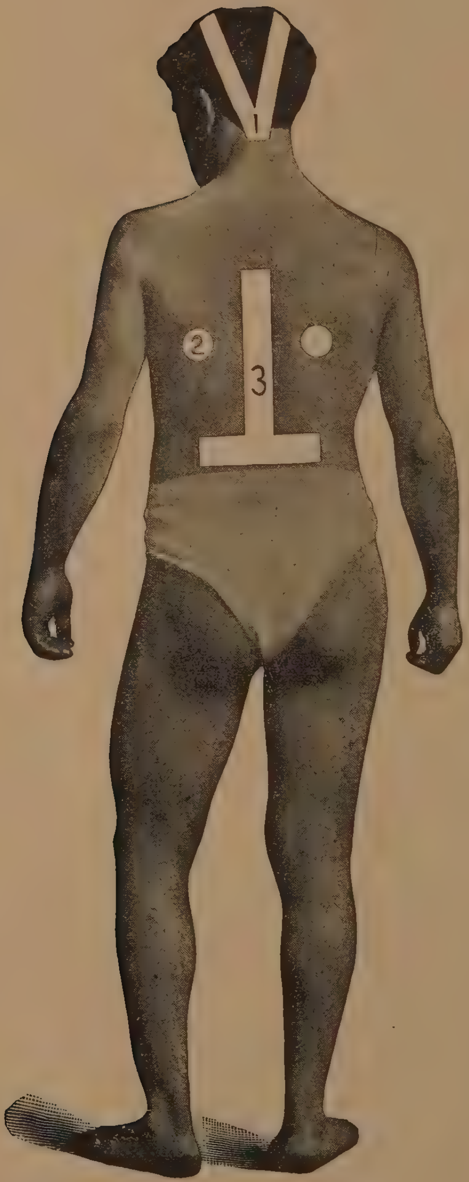
2. Ascarides (Round Worm).—Santonin, one grain several times a day.

3. Oxyuris (Seat Worm).—Naphthalin, 4 x 0.15—0.4; castor oil or calomel.

Ascites (Fukusui).—Treatment of causal diseases, digitalis, diuretics, calomel, puncture.

Jaundice (Oudan).—Artificial Carlsbad; dietary direction; no fat stuffs.

Biliary Calculi (Tanaeki).—For paroxysm apply cataplasm, narcotics internally or hypodermically. Carlsbad-cure, salicylic and bicarbonate sodium given later.



HEADACHE.

Bandages saturated with ammonia, starting at the nerve centre indicated by 1 in the adjoining cut, and passing tightly over the head, are sure to relieve headache. See index—Headache.

CONVULSIONS.

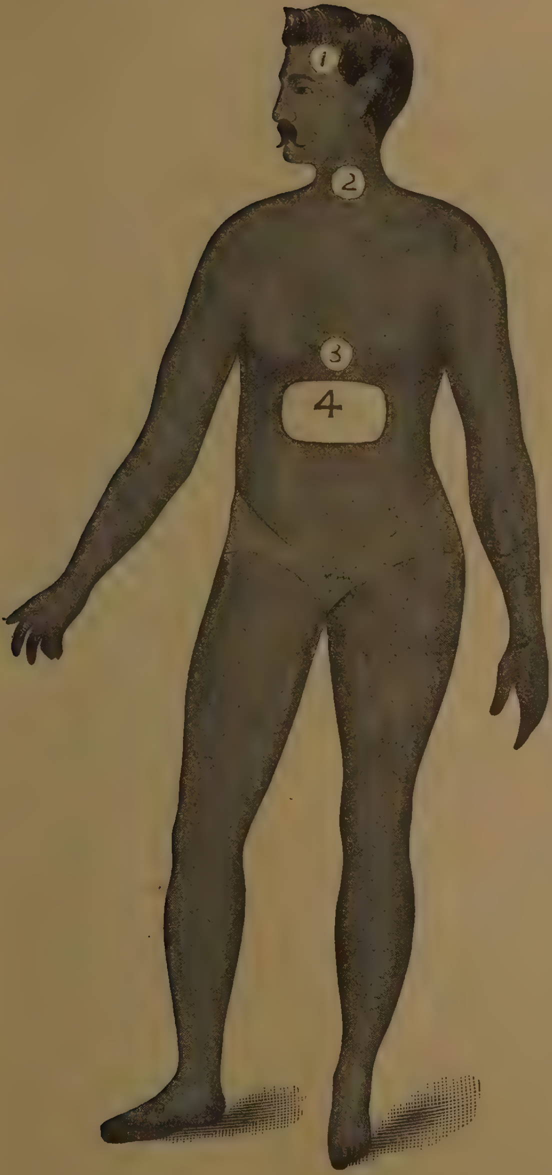
Fits, spasms, convulsions are successfully treated with mustard, turpentine, or some similar application to the back of the neck, just below the spot indicated in the adjoining figure by 1. See index—Convulsions.

PLEURISY.

A favorite remedy for the pains of pleurisy consists in the application of heated salt, or similar heated or drawing applications, acting as counter-irritants, to the back beneath the shoulders, as indicated by circle 2 in adjoining cut. See index—Pleurisy.

CHILLS AND FEVERS.

Many successful medical men treat ague both internally and externally. They find that external applications of stimulating oils to back and loins, as indicated by figure 3 of the adjoining figure, is very helpful to the internal treatment. See index—Chills and Fevers.



NEURALGIA.

A favorite relief for neuralgia is to apply to the temple, at the spot indicated by circle 1, a strong peppermint liniment or astringent poultice. The same treatment applies to any nerve centre. See index—Neuralgia.

DIPHTHERIA.

Many medical authorities advise an external application for diphtheria of turpentine, hot salt water, or petroleum, at the point indicated in the adjoining figure by circle 2. See index—Diphtheria.

LOCKJAW.

Some specialists advise, in conjunction with the internal treatment for lockjaw, a powerful nicotine application externally, at the pit of the stomach, as indicated by circle 3. See index—Lockjaw.

INDIGESTION.

A very effective treatment for indigestion is the outward application of the hot salt bag, or other heating means, to the stomach, as indicated by object 4 in adjoining cut.

THE TREATMENT OF HYDROPHOBIA IN JAPAN.

BY DR. S. IWASAKI.

The full details in the geographical distribution, etiology and symptom of the disease I do not here touch, but it will be of interest to mention a little but mysterious history of the disease in China and Japan.

In China we find in the medical writings about a thousand years ago the words "Ketsue or Sei," meaning rabies of the dog; and in Japan we can say nothing else than that a hundred years ago there were physicians who wrote on the prevalence of rabies in dogs.

We had a prevalence of rabies in dogs at Tokyo, the capital of Japan, in 1870, and at Nagasaki harbor in 1893. The latter was the greater outbreak, and many of the people were victims of this disease. Since that time the disease has drawn medical attention, and thenceforth small outbreaks occurred every year within a limited area in the country.

Virus.—There are two theories, microörganism and chemical toxin, but neither have a firm basis. It is very strange that when the virus is in a dry state, but not absolutely, it never causes the disease, if inoculation takes place in the human body, and has had too long an incubation. The former antagonizes the parasitic theory, and the latter the chemical toxic theory; but no doubt there is some unknown virus which has some affinity for the nervous system. Animal experiment shows that the virus localizes in the brain and spinal cord, especially the medulla oblongata, and also cerebro-spinal fluid, peripheral nerve, saliva, lacryma; suprarenal bodies, thymus, heart, and so forth, contain the virus; but not the liver, spleen and aqueous humor. In the urine and blood sometimes the virus is found, and sometimes not.

The transporter of virus is always saliva, but how this virus reaches to the nervous centre from the bitten wound is still a question. Some observers take the blood theory and others insist on the nerve fibrous theory.

Incubation.—It has several incubation periods, and it oscillates from three days to twenty-five years, but twenty to sixty days are most common, and when the bitten part is nearer to the nervous centre, the shorter the incubation, or *vice versa*. Intemperance hastens the establishment of the disease.

Prophylactic Treatment.—The dogs that have no masters must be killed, and the pets must be muzzled when they go out. But it is necessary to tax higher, as in Germany, where twenty marks is taxed per head. Preventive inoculation can hardly be performed by private practitioners; it is too expensive to prepare and keep the inoculating material; so then the local boards of health must always prepare the inoculation material for an emergency, because the later inoculation is always unsuccessful.

Inoculating Treatment.—When a man is bitten he must be sent to the inoculation department, and there the inoculation takes place; on the other hand the dog is sent to the institute or police station, and must be diagnosed by a veterinarian or bacteriologist; sometimes the suspected dog may be killed for diagnosis. The physician's duty is to advise the patient to get the inoculation, and it is in vain to treat with some caustic medicine or cautery. Indeed the old-fashioned practice often results in danger, because generally there has been a pause of time since the accident to call upon a physician, and some ignorant patients never intend to get the inoculation, thinking the caustic treatment to be sufficient. Now I have the opportunity to confess the carelessness which had occurred in my practice. About nine years ago a patient called on me who was bitten by a dog, and in this case only five minutes had passed since the accident. Then I excised the wound, situated at the right pulp of the thumb, and cauterized. When two months had passed, after he had called on me, the intensive hydrophobia had been established, and then he died. But nine years ago we had not any inoculating departments in Japan.

Since Pasteur began the inoculation in 1885, the first inoculation took place in Japan in 1893, by T. Kurimoto, and in 1897, by S. Kitasato. The method is as follows: First, make inoculation material from the brain of a rabid dog, rubbing in a bowl the mixture of the brain 0.5 grams, and 0.6 percentage saline solution 2.0 grams, then inoculate the rabbits, weight 1800.0 to 2000.0 grams. This inoculation takes place under the dura mata by trepanation, and one or two drops of the above mentioned virus will be injected with the Pravatz's syringe. Then the inoculated rabbits, after about two weeks show paralysis in the hind legs at first, then in the front legs, and die. After dissecting, the whole spinal cord is taken and cut into three pieces, tied with strings and hung in a glass bottle which contains caustic potassium in the bottom; this bottle is kept in a dark place.

Next, to make the preventive inoculation fluid, the cord in which the strength of the virus is lessened by drying is cut five milimeters thick and mixed with three grams bouillon and rubbed in the bowl. The virus is lessened in strength in ratio to the days of drying.

The whole manipulation is done aseptically if possible. To inoculate the human body, begin with the most attenuated virus; that is, the fourteen-day dried one. When it is dried fifteen days the virus is destroyed. And in second inoculation take a thirteen-day dried one; in third inoculation a twelve-day dried one, and so forth. At last two-day dried virus is inoculated; the limit of virus strength has no special value, and Koch limits to two-day dried one, and twenty to twenty-five times; but Kurimoto inoculates twenty to thirty times to a patient.

In Russia (St. Petersburg) they inoculate from six days to two days dried virus, and in Vienna twelve days to two days; in Budapest they inoculate fresh cord diluted with distilled water in ratio 1-10,000; this is called the diluted method and begins in 1-10,000 limited to 1-100.

The doses change by age: under ten years, 1.0 gram; ten to fifteen, 1.5 grams; fifteen to twenty, 2.0 grams; over twenty, 3.0 grams of the mixture. To show the result of the inoculation we mention here the mortality under inoculation treatment:

Japan (Kurimoto)	1.3 per cent., death.
France (Pasteur Institute)	0.8 per cent., death.
Russia	3 to 4 per cent., death.
Budapest	0.37 per cent., death.
Whole of Europe (average)	1.49 per cent., death.

OSTEOPATHY.

Definition.—Osteopathy is the science and art of healing and curing disease without the use of knife or drugs.

Discovery.—It was discovered by Dr. A. T. Still, of Baldwin, Kansas, in 1874.

Principles.—According to osteopathy a natural flow of blood is health. Disease is the effect of disturbance of the blood flow either in one portion of the body or all over.

Requirements of Osteopathy.—Osteopathy demands an exact and most thorough knowledge of the anatomy or structure of the human body. It requires an intimate acquaintance with physiology or the functions of the various tissues, fluids and organs. Added to this is a comprehensive study of psychology or the workings of the mind. It also includes a knowledge of the chemistry and physics of the human mechanism.

Nature Herself Can Cure.—By a study of the above, osteopathy claims to have discovered certain laws of nature and methods of cure within the body itself. By the application of these methods, according to osteopathic practice, nature, herself, may remove the disease and cause the body to again regain its health and strength. This occurs not from any stimulation caused by drugs, but in accordance with certain mechanical principles residing in the body itself.

The Body a Machine.—Osteopathy regards the body as a wonderful mechanism, and treats it as an intelligent machinist would treat a complicated machine with which he was perfectly familiar.

The Human System Perfect.—The human system is regarded as being perfect. Man is believed to have been created complete, having within himself the power to regain health and vigor. Were such not the case, it is argued, the human body would be incomplete, and man would have to look outside for the relief of disease.

By an exhaustive study of the anatomy or structure, and the physiology or functions of this human body, it is observed that man is a complete being, capable of performing his own physical and mental acts when in health.

Disease is regarded as simply disorders. To restore health, the disordered parts must be corrected.

Drugs Harmful.—Osteopathy believes the giving of drugs for the cure of human ills to be both unreliable and unscientific. It absolutely denies the curative properties of drugs. So regards the whole system of drug treatment as unnatural and destructive to health.

Disease Not an Entity.—The osteopath does not look upon disease as a definite enemy which must be attacked by some foreign force. Disease is regarded as a disorder of the normal structure of a part, causing some disorder of the normal function of the body.

The Human Body a Perfect Machine.—The human body is looked upon as a perfect machine. Order is considered the first law of health. If in order, the human machine will do its work properly and run its allotted time.

What Osteopathy Does.—Osteopathy endeavors to discover and correct all mechanical disorders in the human machine, and to direct the recuperative power of nature within the body to the cure of disease. It claims that if there is an unobstructed nerve and blood supply to and from all parts of the well-fed man, the effects called disease will surely disappear.

Treatment.—The treatment is by manipulation. According to Dr. A. T. Still, exciting the nerves causes muscles to contract and compress venous flow of blood to the heart. The bones can be used as levers to relieve pressure on nerves, veins and arteries.

Object of Osteopathy.—The object of osteopathy is to permit a perfect freedom of all fluids, forces and substances pertaining to life. It endeavors to restore the harmonious action of all the parts, which must ensue when they are unirritated by any cause. It aims to maintain the complete circuit of the motor, sensory and sympathetic nerves.

Cause of Disease.—The cause of the disease, according to osteopathy, may be a dislocated or subdislocated bone, ligament, cartilage or muscle, causing an inhibition or irritation of a nerve fibre or an obstruction of an artery, vein, lymphatic or some fluid of the body. This results in disorder to the part of the body to which the affected nerve or vessel is distributed or connected.

These osteopathic disorders are not necessarily surgical dislocations, but are parts out of line, out of proper adjustment. They comprise slight displacements of various structures, chiefly bones and ligaments, with muscular contractions, little adhesions, contractions from cold, irritation or other outside influences, causing unnatural pressure upon vessels or nerves.

Osteopathic Examination.—The patient is examined from the physical standpoint. In the eyes of the osteopath he is a machine out of order. By his knowledge of the details of the human machine, when in health, the osteopath feels able to detect the disorders that are present in disease.

Through a highly developed sense of touch and a knowledge of anatomy, the osteopath claims to be able to discover the slightest anatomical disorder. The conditions present and the symptoms shown are used as clues to find the cause of the disease. By means of these signs and symptoms the nerve supply of the diseased part is traced to its origin and the course of the blood channels is followed from the parts diseased to the exact region where the abnormal condition is caused. When the primary lesion, or the point where the disease is caused, is located, treatment begins.

Osteopathic Treatment.—The object of treatment is to aid nature in reëstablishing the normal activities of the diseased part.

The mode of treatment is a scientific manipulation by which the dislocation is reduced and the disorder relieved. The manipulation is based on the physical laws governing the actions of the human machine.

The osteopath applies the mechanical principle which is indicated in each separate case. Every move made by him in treatment is with the definite purpose of correcting the anatomical disorders.

Probably the best description of osteopathy was that given by J. Martin Littlejohn, Ph. D., LL. D., F. S. S. C. and F. R. S. L., in an address before the Royal Society of Literature, London. Dr. Littlejohn says:

"Osteopathy is based on accurate knowledge of the anatomical structure and physiological functions of the body organism.

"Nature has placed within the body certain vital forces, vitalized fluids, and vitalizing processes and activities, which, in harmonious accord with one another, maintain the equilibrium of the body mechanism; any disturbance of these forces, fluids or processes and any interference with their activity, circulation or distribution involves the absence of harmony and interference with the body order.

"Osteopathic manipulations aim to restore these to their normal condition, so that the body may regain its normal functional equilibrium and form. In this way osteopathy claims that life is revitalized and strengthened by vital forces, vitalizing fluids and processses, disease being removed or overborne by getting rid of an abnormal structural alignment that produces disharmony in the body and prevents normal functional activity. . . .

Diagnosis.—"The osteopathic diagnosis is reduced to the discovery or attempted discovery of the cause or causes of a disease.

"Diagnostic conditions may be summarized under these heads:

"(1) Misplacements of bone, cartilage, ligament, muscle, membrane or organs of the body;

"(2) Disturbances in the fluids of the organism, including the blood, the lymph and other secretions of the body; and

"(3) Disorders or derangements by tension, inpingement, thickening, induration, and so forth, of the nervous system, including its centres, ganglia, plexuses and fibres.

Therapeutics.—"Following up this line of physiological thought the osteopathic therapeutics is simplified and will consist of the correction or the removal of the cause or causes of disease.

"Corresponding with the diagnostic points, we find:

"(1) Scientific manipulations that aim to correct displacements in the bony and other tissue structures of the body, in its membranes or organs;

"(2) Scientific manipulations that are designed to rectify the disturbances in the circulation of the body fluids and to restore them to their normal condition, especially blood conditions and defects in the blood circulation and distribution; and

"(3) Scientific manipulations that utilize the nervous system with its fibres, ganglia and centres with the view of correcting the nervous disorders, toning up the general system or its local parts, promoting trophic conditions of the nerves and muscles and stimulating a normal correlation of the psychic with the physiological and vegetative functions of the human system. . . .

The Essential Principles of Osteopathy.—"The essential principles of Osteopathy may be set down thus,

"(1) Health is natural; disease and death between the time of birth and old age is unnatural;

"(2) All bodily disorders are the result of mechanical obstruction to free circulation of the vital fluids and forces, and the continuity of nerve forces.

"(3) The impediments in the way of free fluid circulation and uninterrupted nerve force are found in osseous displacements, contracted muscles, ruptured ligaments, constricted or dilated vessels, hypertrophied tissue substance or congested conditions of the tissues.

"(4) These abnormal conditions represent not only the change in structure or function on the part of particular portions of the organism but also produce physiological disorganization of the vital forces of the body, producing an irritable condition either of overstimulation, under-stimulation or inhibition resulting in excessive activity, partial activity or inactivity of the vital forces and processes.

"(5) In the restoration to the normal the main purpose in operative manipulation is to coördinate the vital forces, to restore harmony in the vital functions and thus aid nature in the elimination and checking of diseased conditions."

PRACTICAL OSTEOPATHY.

In etiology, symptoms and prognosis osteopathy does not differ from the other schools. It is in diagnosis and treatment that osteopathy stands alone.

To illustrate the practical workings of the osteopathic therapeutics the treatment of a few of the more common conditions are given as contained in "Notes on Osteopathic Therapeutics," by C. P. McConnell, D. O., Lecturer on Osteopathy at the American School of Osteopathy, Kirksville, Mo.

FEVER.

"In the treatment of fever, which is only a symptom of disease, it should be remembered that the germ of disease lies in the fascia, and it is our work to abort this germ at whatever point it may be found in the fascia. An affected fascia produces the nourishment of disease. Our work is to control the artery to the affected region that is producing the fever and then quiet the efferent nerves to the heart at the occiput.

"In restoring the equilibrium of the blood pressure it must be borne in mind: That stimulation of the vaso-motor centre, especially through the superior cervical ganglion of the sympathetic, increases the heart's action and blood pressure, while an inhibition lessens the heart's action and blood pressure. That through the cervical region we at least control the cutaneous vascular system of the upper portion of the body and at the fifth lumbar the blood supply to the legs.

"That the splanchnics are capable of controlling a large proportion of the blood of the body and perhaps the venal splanchnics to the supra-venal capsules influences to some extent the heat of the body.

"That relaxing the tissues about the abdominal aorta will dilate that vessel and thus aid in reducing the blood pressure.

"That relaxing the tissues about the ureters and opening them freely will be of great service in the elimination of waste fever products through the kidneys.

DIARRHŒA.

"Examine the condition of the spine thoroughly. The muscles in places are apt to become contracted owing to increased nerve force to the centres that supply the parts. This will give a clue to the treatment. Inhibition of the nerve force along the spine at the affected points will usually do the required work. That is, thorough inhibition, relaxing contracted muscles and correcting abnormal vertebræ.

"Open up the mesenteric circulation as in all cases of bowel trouble.

"Some cases of diarrhœa originate in the sympathetic and spinal nerves of the rectum. Give treatment over the sacral nerve to remove the irritation.

"The lower ribs from the ninth to the twelfth can become subluxated and irritate certain nerves that have no important bearing upon the intestines. I have corrected several cases of diarrhœa by replacing certain ribs in this region, especially on the right side.

"Remember that the vagi have an important relation to the blood supply and motor nerve force of the intestines. Daily hot baths and rest in bed with activity of the skin and kidneys will be of great aid in many cases.

PLEURISY.

"Trace the course of the nerve back to the origin from where the stitch or affection is produced and remove the irritation. In the beginning one should find no difficulty in relieving the sufferer. It is a matter of correcting a disturbance of the sympathetic or phrenic nerves through the intercostal and phrenic nerves.

"Relieve obstruction of the intercostals and the internal mammary arteries from their branching of the aorta and subclavian vessels.

"By removing obstruction to these vessels will prevent the exudation. The obstruction usually comes from the subluxations of the ribs due to injuries or by contractions of the thoracic muscles by catching cold."

PAPA'S PEACH.

Book IX.

MODEL HOME MANAGEMENT.

THE GENERAL CARE OF CHILDREN.

Important.—The proper management of children is the most important subject that can be brought to the consideration of a parent, and yet it is one that has been greatly neglected. Mothers undertake the management of children without previous instruction, thinking it can be learned by instinct, or by affection. The consequence is they find themselves too often in a condition of uncertainty and trouble, and act not unfrequently directly in opposition to the best physical and mental welfare of their charges.

Before Birth Management.—Undoubtedly the proper management of a child begins even before birth! Prenatal influences and education are of vast importance; yet how greatly neglected and persistently misunderstood! Those who would have healthy children must be themselves healthy. They must obey the laws of nature and morality. They must not expect good fruit from poor soil. Physical strength, good organization, agreeable temper, and nobleness of mind beget their like; drunkenness, debility, debasement of body and mind yield similar characteristics in the progeny. Children who inherit the former start from the highest vantage ground; children with the latter start in the race of life handicapped and at a great disadvantage.

MOTHER'S CARE DURING PREGNANCY—CLOTHING, BATHS, EXERCISE, DIET, REST, ETC.

Clothing.—From the earliest moment after conception the mother should pay even more than usual care to her personal health. Her clothing should be loose and comfortable, and adapted to the gradual development of her abdomen and breasts. Tight lacing is injurious to both child and mother, and should be carefully avoided.

Baths.—The judicious use of tepid baths once or twice a week, with a daily sponge bath of lukewarm water, followed by friction with a coarse towel, will be conducive to her welfare.

Exercise.—The mother should also take short, gentle and frequent walks during the whole period of pregnancy. In fact she should spend much of the time in the open air, with mild exercise and occupation, and in this way her general health will be kept in proper tone, the bowels open, and the growing fœtus will be nourished and strengthened, and the foundation laid for an easier labor and a good getting up.

Advantage of Toil.—This abundance of air and occupation explains the rapid labors and speedy recoveries of poor women. Such need to work, but in their very toil they are favoring nature's operations, and their compensation is in an easy confinement, unattended with much inconvenience or anxiety. Indolence during pregnancy is enervating to mother and fœtus.

Pregnant Women not Invalids.—A pregnant woman is not an invalid. She is not compelled to lie down most of the time. To be with child is a natural physiological process, the fulfilling of the Divine mandate, and the highest crowning act of womanhood.

Diet.—The pregnant woman should exercise some care of her dietary. Meat should be eaten but once a day; rich soups and highly-seasoned foods avoided, and all alcoholic and other stimulants strictly shunned. She should eat rather less during early pregnancy than at ordinary times; for while it is true she has two to provide for, yet she has less drain upon her system, from the fact that she no longer is unwell, and the fœtus, up to the third month, is not much larger than an egg. An overloaded stomach also may favor the distressing nausea and morning sickness of early pregnancy. During the latter months of pregnancy the diet should be fuller, for if it is too light it is likely to make the mother a poor nurse for her child, both in the quantity and quality of her milk.

Rest.—A pregnant woman should retire early to rest—at least by ten o'clock—and be up in good time in the morning for her ablution, morning stroll in seasonable weather, and an early breakfast. In short, she should use every means in her power to make and keep herself healthy, not only for the sake of herself and her husband, but also for the sake of her forming child and for the welfare of the human race.

Dangers to the Fœtus.—It should be borne in mind that the period of intra-uterine life is one full of danger to the health of the fœtus; not only does ill health in the mother react upon the defenceless little creature, but it may be, her thoughts, her mental and moral states, her passions, are reproduced in the child.

Comfort for the Mother.—It is of the utmost importance then that she be surrounded with comfort, cheer and happiness; that no unkindness be shown her by her husband or family; that she have all advantages of mental ease and comfort to implant in the miniature human being qualities good and noble. How readily mothers believe in birth-marks, and yet how ignorant or negligent are they of prenatal impressions affecting health and morals.

Mutual Injuries.—It is to be remembered that during a prolonged period mother and child form together but one living system, and whatever injures the mother's constitution also involves that of her progeny.

It must be borne in mind that the health of the father, at the time of the impregnation, also influences very much the future child's welfare.

CARE OF THE NEW-BORN INFANT.

While no one is herein advised to usurp the place of a physician or a skilled nurse in the lying-in room, yet, under peculiar circumstances, it may fall to the lot of some member of the family to act in an emergency as a nurse or even as a physician.

What to Do in Absence of Physician.—In such a case after the child has been born care should be exercised that no blood or fluid be drawn into the lungs during efforts to establish breathing. As soon as the child breathes well and cries lustily several times, the cord may be tied and cut in this fashion: Take a piece of strong heavy wrapping cord or a braided silk, a fishing line serves admirably, and tie the cord two fingers' breadth from the belly. Tie again further away and cut the cord between the two strings. Should the child not breath well when born hold it up by the feet. This gives an opportunity for mucus and fluid to run out of its mouth. Spank it gently. If the cord beats feebly cut it and remove the baby from the mother.

To Start Breathing.—If it has not yet begun to breathe souse its body quickly in cold or hot water. Immerse in hot and cold water alternately, frequently hang it head downward. Once the child breathes well or cries well roll it in a warm blanket or woolen shawl, lay it on its right side in a suitable place until the mother has been cared for as described in a previous chapter.

Bathing.—All strong, well-developed infants may be given a thorough cleansing bath soon after birth. If the child is covered by a white cheesy substance it may be thoroughly greased with advantage. For this purpose pure olive oil is superior, although unsalted hog's lard or vaseline makes a good substitute. After rubbing this cheesy substance loose with the grease give a soap and water bath. To give the bath the child should be laid across the lap on a blanket or large soft towel. The bather should wear a rubber apron and should have on a chair by her side a large basin of warm water and a bar of castile soap. A soft wash cloth or bath sponge may be used for the washing process. This completed, wrap the child in the towel and dry the skin by rubbing on the outside of the towel. Dry within all folds of skin very carefully. The entire body may now be dusted with baby powder, lycopodium, talcum or powered starch.

Caring for the Eyes.—If the eyes are now properly cleansed that condition which mothers so dread, "sore eyes," may be avoided. They are best cleansed by dropping sterile boiled water in them by means of a new clean medicine dropper. A boric acid eye wash may be employed if the eyes seem to be inflamed at birth.

Boric acid	1 teaspoonful
Distilled water	5 ounces

Note.—Should the child be very weak or breathe feebly it is well to postpone bathing or simply grease the child and wait until it is stronger before using soap and water.

Care of the Navel (*Umbilicus*).—Our grandmothers were wiser than they knew when they used singed linen to dress the umbilical cord and umbilicus (navel string and navel). We know that only sterilized dressings should be used about the navel. Among the best is sterile or borated cotton or sterilized gauze. If there cannot be had any piece of soft cloth or linen may be sterilized by baking in an oven for one-half hour and handled only with clean hands. In dressing the cord it should first be washed clean with sterile or boiled water, then dusted with some antiseptic dusting powder. Boric acid is frequently used, although the following formula will be found more frequently used by physicians and obstetric nurses:

Acetanilid	1 part
Powdered starch	4 parts

Mix well, and use as a dusting powder.

℞.—Acetanilidum	ʒij
Glyceriti Amyli	℥i

Ft. Mix and use as a dusting powder.

Applying the Dressing.—Your cloth or gauze may now be applied. Take a piece about four inches square, cut a hole in its centre, pass the cord through and lay it upward and toward the left, add more dusting powder and fold in the edges of the dressing. The bandage may now be applied.

Dropping of the Cord.—The stump of the cord usually separates within a week although it may remain longer. The rule is to allow it to drop off of its own accord. At any time when adjusting the bandage if the dressing is blood-stained or if pus is seen about the navel call the physician's attention to it at once.

The Bandage.—The bandage is applied to the infant's body for two reasons: First, to keep in place and to keep clean the dressings on the cord; second, to furnish support to the abdomen, and protect the intestines. During infancy the child uses all of its abdominal muscles at each breath, hence it is important that the bandage be pinned just snugly. If too tight, it will interfere with breathing. It may, too, cause greater than normal pressure in the groins and hernia may result. The bandage should either be knit or should consist of a strip of flannel six inches wide and eighteen inches long. The bandage should be worn from three to six months.

Baby Clothes Prepared Before Birth.—One dozen white gowns for day
One-half dozen woolen gowns for night.
Six abdominal bandages.
Six woolen undershirts.
One-half dozen knit socks.
One dozen large safety pins.
One dozen small safety pins.
One-half dozen large, soft towels.
Three or four baby wash-cloths.
Powder, powder-box and puff.
Two light, soft shawls.
Two dozen diapers.
Two flannel bathing aprons.
One rubber apron.

The Crib.—A crib is better than a cradle. It should be provided with a cheap mattress and a macintosh, two soft blankets, two pillows, a washable comforter and a counter-pane. A good-sized clothes-basket with a large hair pillow makes an excellent crib for early infant life. It is especially useful when the child is weak, and artificial heat must be supplied. (See Care of Premature Infants.)

THE CARE OF PREMATURELY-BORN CHILDREN.

Premature Birth.—Fright, accident or disease may cause the pregnant woman to deliver herself of her infant before term. Physical deformity of the mother may make it necessary for the physician to bring on labor some weeks before term. The care of infants born under such circumstances causes parents and nurse great anxiety. The lives of many such infants are sacrificed yearly because the average nurse (untrained) knows nothing of their care.

Incubation.—Every effort must be made to conserve the heat of the prematurely-born infants. To do this successfully, an artificial media must be supplied to take the place of the mother's womb. To speak figuratively, the "hatching" must be completed. Incubators are made for this purpose, and are for sale or for rent in every large city in this country. These incubators are planned similarly to the incubator in which chicken eggs are hatched. The great advantage of this apparatus is, a uniform high temperature can be obtained, and the moisture of the atmosphere accurately regulated. Feeding can also be done without disturbing the infant, or allowing much heat to escape.

Basket Heat.—Where parents are unable to secure the use of an incubator because of distance, or for financial reasons, a useful method of obtaining heat can be made use of in their own home. Take a large clothes-basket, line it with a double blanket, place on its bottom, and stand around its sides a row of hot water bottles (beer bottles filled with hot water serve admirably), reline with another blanket, and place a thin pillow over the bottom row of bottles, and you have an improvised incubator that has saved the lives of several infants in the hands of the writer, that otherwise would have perished.

Bathing and Clothing.—Prematurely-born infants must not be given a general bath. The face, if soiled, may be cleansed. The entire body should be greased with olive oil, lard or vaseline. The cheesy substance wiped off with cotton. The entire body, except around the anus and face should then be sheathed in carded lamb's wool or raw cotton, and around the whole, a bandage. A bunch of cotton may be placed over the anus, to receive urine and feces.

Temperature.—The infant must now be provided with a high, even temperature, varying from 95 degrees to 85 degrees Fahrenheit, depending upon how weak it is when born. No other clothing is required, except a blanket cover. This temperature can be accurately maintained with the incubator, or approximately maintained with the basket properly and skillfully manipulated.

Feeding.—The mother's breast should be pumped, and the milk thus gotten kept warm by placing in a cup standing in warm water. It should be given to the infant as soon as possible after being drawn. It is best given by means of a medicine dropper. Where the mother has no milk, milk may be prepared as per formula No. 8, or modified milk, and then dilute it one-half with sterile water. Only a few teaspoonfuls can be given at a feeding. The infant must be kept by its artificial heat, or in the incubator while this is being done. It may even be fed without waking.

General Directions.—Such infants sleep almost continuously, and cry usually when too cold. When too hot they will be seen to be restless, and to breath rapidly. These observations must guide in regulating temperature. Should stimulants be required, the physician will direct the kind of stimulation and dose. The child must not be removed from its "wool" or "cotton" "suit" for a soap and water bath until such time when it would have been at term if unborn, and not then unless it appears to have gained strength.

To remove soiled cotton about anus, do so by turning child on its side; remove cotton, wipe off buttocks with moist cloth; replace fresh cotton, and turn child back as before. Do not drag a prematurely-born child out of the incubator or basket to nurse it or to show it to inquiring friends.

Infant Bathing.—An infant should be regularly bathed from head to foot once a day. The water should be tepid—not hot—and barely warm. After the child is three weeks old it may be put into the water and support d with one hand, while it is washed with the other. It is surprising how soon it will learn to enjoy its bath, to splash and play in the water. Never allow it to remain too long in its tub—from ten to twenty minutes is the limit, the latter time being for a healthy child in warm weather. Wet its head before putting it into the bath. This is to guard against congestion. Use white castile soap, and either a very soft sponge or an equally soft flannel or linen cloth. Wipe quickly, and dry with a soft towel, holding the child meanwhile upon a blanket in your lap. See that every little crease is wiped out and powdered with cornstarch or talcum powder. Burnt flour should be used in case of chafing. Be careful to guard against draughts, and bathe the child near an open fire, if possible—if not, the bath should be given in a perfectly warm room. Have the clothing hanging at the fire, well warmed and ready to put on at once. The petticoats should be put one in the other, and the dress over them, so that all three may be slipped on at once. Every little waist should be furnished with buttons or buttonholes and with drawing-strings at top and bottom for drawing to the proper size.

Care of the Mouth.—The mouth of the nursing child should be gently cleansed several times a day with a piece of soft linen dipped in boiled water, or boric acid solution. The mother's or nurse's hands must be clean when washing the baby's mouth. It is particularly important to keep the breast-fed baby's mouth clean, lest the baby infect the mother's nipple, and sore nipples or even breast abscesses result. It is equally important during teething.

Care of the Genital Organs.—It is of the greatest importance to begin in early infancy an intelligent inspection and cleansing of the genital organs. With boys the penis should be examined; the foreskin drawn back over the shaft of the penis; any secretion beneath the skin should be removed with a soft cloth and warm water. The skin should then be drawn forward again as soon as the cleansing has been completed. If this precaution is not observed the penis may become swollen to such an extent that it may become impossible; if the foreskin can not be withdrawn over the penis the boy should be circumcised. Proper cleansing beneath the foreskin will prevent, or often cure, bed-wetting; will prevent premature erections; playing with the penis, and masturbation.

Caring for the vulva and clitoris in girls is equally important, but much simpler to do. It prevents the formation of habits not alone loathsome and disgusting, but augurs for the future health of the child.

Care of the Eyes.—It is well to cleanse the eyes of the new-born infant as directed in giving its first bath. Its eyes may be advantageously cleansed with sterile water, or boric acid solution used from a dropper several times a day for some days after birth. It is not necessary to use medicine or eye washes in the baby's eyes to strengthen them; but during the first three months, when but few tears are secreted, the eyes may be cleansed as above, when dust or dirt of any sort gets into them.

The abominable custom of mothers and nurses taking babies out in carriages without sunshades, allowing the child to lie on its back with the sun beaming on the baby's face, cannot be too strongly condemned.

CLOTHING FOR THE INFANT.

Quality and Quantity.—The quality and quantity of the child's clothing must be regulated by the means of its parents. Every mother will probably have the best she can afford, but, whether rich or plain, it should be carefully made; all seams felled, and no rough edges left to chafe the tender skin. Six of every garment—three night flannels and three for day—constitute the minimum layette. Twelve diapers may answer, by careful management, but unless they can be washed every day at least eighteen will be required. A flannel cape or a woolen shawl is necessary to throw around the child in passing from one room to another during the first weeks of its existence. Summer and winter, until it is two years old, it should wear a flannel shirt long enough to cover the abdomen.

Warmth Required.—During the early months of the child's life, warmth is peculiarly needful for the infantile system, and where there is any tendency to weakness and imperfect development of animal temperature, flannel clothing is particularly necessary to favor the accumulation of warmth in the infant's body. Benefit may also result from its gentle stimulating action upon the cutaneous surface. In hot weather muslin may be used instead of flannel, but even then a careful mother or nurse will change at once the clothing to suit the varying states of the weather. In summer infants are not infrequently kept too warm by too thick and warm coverlids while sleeping.

The Rubber Diaper.—The rubber diaper has many friends and many foes, and there is much to be said on both sides. If the nurse is careful it will be found a comfort, since it keeps the clothing dry and can do no harm except where it is made an excuse for not changing the child as frequently as is necessary. When it is used there should be two or three, and they should be frequently aired. Wash them always in cold water and wipe on a towel; then hang them in a cool place to dry. When the baby's skin is very delicate their use may cause chafing, unless great care is taken; this is the only valid objection urged against them.

Dress for an Airing.—When the child is sent out for an airing, which may be done in two weeks after birth in summer and in a month's time in winter if the weather is good, and in midday, be sure that it is well wrapped. A knitted worsted spencer, buttoned behind, for wear under the cloak, and a shawl over all if the weather is cool, will protect the little one from harm.

When to Shorten the Clothes.—The proper time for "shortening" the clothes is about the end of three months in summer, or six months in winter. This shortening should be only of the extra length, being still long enough to extend below the feet for nearly a year, to protect the lower parts of the body against changes in temperature. By the end of a year the feet should be entirely free, so as to allow free motion of the legs.

Danger of Wet Clothes.—The child should be kept dry as possible. Wet diapers or stockings, when permitted to remain on the child for some time, give rise to bowel and febrile complaints. They tend to cover excoriations and painful irritation of the skin about the groin and buttocks. Examine frequently the underclothing of a child, and if any part be found wet, immediately replace it by a dry and clean one.

INFANT FEEDING.

Obstacles to the Mother's Nursing.—Circumstances ofttimes arise when the mother cannot, or should not, nurse her infant. Disease of mother or child, a poor development of breasts or nipples and absence or lack of milk development, or even the premature birth of child may prevent breast feeding. It is always best for mother and child to continue breast feeding at least a few weeks unless forbidden by the physician.

Breast Feeding.—The infant should be applied to the breast six or eight hours after birth, and four or six times a day thereafter, until milk formation is fully established. This accomplished the mother must establish regular hours for feeding. From 6 A. M. to 10 P. M. she should nurse it every two hours, and through the night period every three hours (see special table for maternal feeding). The nipples as well as the child's mouth should be cleansed carefully with a boric acid solution before nursing, and cleansed with pure water afterward. A scarcity of mother's milk must be met with tonics and nourishing food.

Wet-Nursing.—When a mother cannot nurse her child, a competent wet-nurse is most desirable. She should be known to be free from bad habits; to be moral; to be even-tempered; to be clean and free from disease. There ought not to be a period of more than two or three months between the age of her babe and the one to be nursed. The same hours for feeding night and day should be exacted of her that the mother should give.

Mixed Feeding.—Where a mother's milk is not sufficient in quantity it is wise to continue nursing at night and several times during the day. At the other nursing periods give modified cow's milk, or some infant food prepared for a child of the same age, bottle-fed.

Artificial Feeding.—Artificial feeding of infants has undergone such complete changes in recent years that the advice of elderly mothers and grandmothers cannot be depended upon. Now that we know many kinds of germs infect milk as brought from the dairy, sterilization must be insisted upon. Now that many men in every large city devote their time exclusively to infant disease and infant feeding we have gotten out of the rut in which physicians, mothers and nurses formerly trod. Manufacturers of infant food found it necessary to so modify methods of preparation that their finished products would harmonize with proven ideas.

Dr. Holt's Opinion.—One broad assertion made by Dr. Holt in this regard meets with universal present approval. "All students of infant feeding agree that no artificially fed infant can safely be kept upon any permanent diet which does not contain fresh cow's milk."

Modified Cow's Milk.—In the hands of an intelligent mother or nurse the home modification of fresh cow's milk is, next to mother's milk, the best infant food.

The following comparative table will help the better to understand why the various dilutions of milk are made:

MILK FROM NURSING MOTHERS.

Fat	4	per cent.	Total solids	12.65 per cent.
Sugar	7	"		
Proteid	1.5	"		
Ash	.15	"		
Water				87.35 "
Reaction				Persistently alkaline

MILK FROM A SOUND COW.

Fat	4.04	per cent.	Total solids	13.45 per cent.
Sugar	4.55	"		
Proteid	4.15	"		
Ash	.71	"		
Water				86.55 "
Reaction				Feebly acid

What the Above Tables Tell.—From the above tables it will readily be seen why cow's milk alone is not a suitable food for infants. It will be seen that normal cow's milk has about the same proportion of fat as human milk; that it has much less sugar; that it has nearly three times as much proteid substance, and that the percentage of ash, or mineral matter, is far too high. Add to these facts the well-known truth that the proteid of cow's milk is more difficult to digest than that of human milk, and you have sound reasoning for modifying cow's milk, as shall be directed hereafter.

A perusal of the table analysis of colostrum, the first secretion in the human breast, should now be made.

ANALYSIS OF COLOSTRUM OR FIRST MILK.

(The breast secretion before milk is formed.)

Fat	1.71	per cent.	Total solids	9.32 per cent.
Sugar	4.90	"		
Proteid	1.72	"		
Ash	.79	"		
Water				90.88 "

Meaning of Above Table.—From this table the careful reader will see how little fat the infant gets during its first days after birth. The infant fed artificially should be given such a modified milk that its chemical analysis will approximate first colostrum, later human breast milk, and still later, human breast milk plus its enrichment by the mother eating large quantities of rich, highly nutritious food.

Medical Method.—In large cities, and where families can afford the expense, this is easily done by the physician. He just writes a prescription similar to the above table, adding the amount of food wanted at each feeding and the number of feedings per day. This prescription is then sent to the milk laboratory where it is accurately and scientifically prepared just as medicine is compounded in a pharmacy. This method is expensive and can only be used by those who need not consider cost.

Home Method.—This method may be closely approximated, however, at home by using a list of tables very carefully worked out experimentally. In these tables the cream used has been skimmed cream of a twelve hours rising. No ash or mineral matter allowed for except that in water.

First and Second Week.

Chemical Formula.			*Home Formula.*		
Fat	2	per cent.	Cream	4	ounces
Sugar	5	"	Milk	0	"
Proteid	.75	"	Milk sugar	6	teaspoonruls
Water	92.25	"	Lime-water	1	ounce
			Water	15	ounces

Third Week.

Fat	2.5	per cent.	Cream	5	ounces
Sugar	6	"	Milk	0	"
Proteid	1	"	Milk sugar	7½	teaspoonfuls
Water	90.5	"	Lime-water	1	ounce
			Water	14	ounces

Fourth to Sixth Week.

Fat	3.5	per cent.	Cream	6	ounces
Sugar	6	"	Milk	1	ounce
Proteid	1	"	Milk sugar	7½	teaspoonfuls
Water	89.5	"	Lime-water	1	ounce
			Water	12	ounces

Sixth to Eighth Week.

Fat	3.5	per cent.	Cream	7	ounces
Sugar	6.5	"	Milk	1	ounce
Proteid	1.5	"	Milk sugar	8½	teaspoonfuls
Water	88.5	"	Lime-water	1	ounce
			Water	11	ounces

Second to Fourth Month.

Fat	4 per cent.	Cream	8 ounces
Sugar	7 "	Milk	1 ounce
Proteid	1.5 "	Milk sugar	9 teaspoonfuls
Water	87.5 "	Lime-water	1 ounce
		Water	11 ounces

Fourth to Tenth Month.

Fat	4 per cent.	Cream	8 ounces
Sugar	7 "	Milk	2½ "
Proteid	2 "	Milk sugar	8½ teaspoonfuls
Water	87 "	Lime-water	1 ounce
		Water	8½ ounces

Tenth to Twelfth Month.

Fat	4 per cent.	Cream	8 ounces
Sugar	7 "	Milk	5 "
Proteid	2.5 "	Milk sugar	7¾ teaspoonfuls
Water	86.5 "	Lime-water	1 ounce
		Water	6 ounces

FOR WEANING.

Fat	4 per cent.	Cream	8 ounces
Sugar	5 "	Milk	7½ "
Proteid	3 "	Milk sugar	6 teaspoonfuls
Water	88 "	Lime-water	1 ounce
		Water	3½ ounces

Why Lime is Added.—In these mixtures the lime-water is added to preserve the alkalinity of the milk as well as to add lime salts for the food. Where the water used comes from lime rock beds it will not be necessary to add so much lime-water. In such cases, and, indeed, in many cases weak barley-water or arrow-root-water agrees better with the infant than plain water.

HOW PREPARE A DAY'S FOOD.

Consult the table for intervals of feeding and quantity to feed; for example: a four weeks old baby. It will be seen that nine feedings by day and one feeding by night is advised. Each feeding consists of one and a half to two ounces of food. A glance shows that from fifteen to twenty ounces are required for twenty-four hours. Make up the food as follows from table fourth to sixth week:

Cream	6	ounces
Milk	1	ounce
Milk sugar	7½	teaspoonfuls
Lime-water	1	ounce
Water	12	ounces

Dissolve the milk sugar in the water, add lime-water, milk and cream; mix thoroughly in vessel and divide in ten nursing bottles. Plug each bottle with clean cotton and stand in a kettle of warm water. Place the kettle over the fire, keeping the water boiling twelve to fifteen minutes. Do not allow the food to boil. Remove the nursing bottles and place in a cool place until ready for use. When ready to feed the baby take a bottle, stand in lukewarm water until heated, remove cotton, and place over the bottle a freshly scalded nipple and you have a sweet, clean, sterile infant food.

Nursing Bottles.—Bottles of medium size and round, with flat bottom and small, short necks are best. Rubber nipples which slip over the neck of the bottle are the only safe nipples to use. All nursing bottles having rubber tubes and nipples are dangerous, dirty and should not be used. All bottles must be cleaned as soon as empty and again before refilling they must be cleansed with boiling water. The nipples must be turned, cleansed with soap and water and boiling water and may then be kept in boric acid solution until ready for use.

TABLE SHOWING FEEDING HOURS AND QUANTITIES.

Age.	Interval hours by day.	Interval hours by night.	Number of day feedings, 6 A. M. 10 P. M.	Number of night feedings, 10 P. M. 6 A. M.	Number of feedings in 24 hours.	Amount at each feeding.	Total amount in 24 hours.
1 Week	2	3	9	2	11	1 oz	10–11 oz.
2 “	2	3	9	2	11	1 to 1½ “	11–14 “
4 “	2	4	9	1	10	1½ to 2 “	15–20 “
6 “	2	4	9	1	10	2½ “	25 “
8 “	2½	4½	7	1	8	3½ “	28 “
3 Months	2½		7		7	4 “	28 “
4 “	2½		7		7	4½ “	31 “
5 “	3		6		6	5½ “	33 “
6 “	3		6		6	6 “	36 “
7 “	3		6		6	6½ “	39 “
8 “	3		6		6	7 “	42 “
9 “	3		6		6	7½ “	45 “
10 “	3		6 or 5		6 or 5	8 or 9½ “	48 “
11 “	3		5		5	9½ “	48 “
12 “	3		5		5	10 “	50 “

This table shows equally well the hours and intervals to feed a breast-fed baby.

Condensed Milk.—Condensed milk fattens babies to an abnormal extent, and while they are fat and plump, experience shows that they are too weak to withstand any trifling disease. It is a poor permanent food. It does have a useful place in infant feeding. While traveling or during the night in hot weather, it is an excellent substitute for the regular food. It should be made up for a single feeding at a time. For a child three months old.

Condensed milk	2½	half-teaspoonfuls
Water	2	ounces
Lime-water	2	teaspoonfuls
Salt		a small pinch

This quantity may be increased or decreased according to the age of the child.

Weaning Time.—The age at which a child may be weaned has been suggested to be sometime between the eighth and fourteenth month. Much depends upon mother, child, surroundings and season. A strong child may be weaned early. It is best to avoid weaning in summer. If the mother or nurse cannot attend personally to preparing the food, and keeping bottles and food scrupulously clean, it is wise to continue nursing even the full fourteen months.

Gradual Weaning.—If the child is weaned early, do it gradually by substituting some artificial food. If late, the mother may stop the breast at once, and the child will experience little difficulty in transferring to some other food. Should the mother again become pregnant, she must wean her infant.

RULES FOR MANAGING THE INFANT DURING THE SUMMER MONTHS.

The great increase of sickness and death among young children during the summer months is due largely to ignorance on the part of mothers and nurses. Attention to the following rules would save many a life:

1. Bathe the child once a day in tepid water. If it is feeble, sponge it all over twice a day with tepid water, or with tepid water and vinegar.

2. Avoid all tight bandaging. Make the clothing light and cool, and so loose that the child may have free play for its limbs. At night undress it, sponge it, and put on a slip. In the morning remove the slip, bathe the child, and put it in clean clothes. If this cannot be afforded, thoroughly air the day clothing by hanging it up during the night. Use clean diapers, and change them often.

3. The child should sleep by itself in a cot or cradle. It should be put to bed at regular hours, and be early taught to go to sleep without being nursed in the arms. Without the advice of a physician never give it any spirits, cordials, carminatives, soothing syrups or sleeping drops. Never quiet it by candy or cake; they are the common causes of diarrhœa and of other troubles.

4. Give the child plenty of fresh air. In the cool of the morning and evening send it out to shady places. Whenever it seems to suffer from the heat, let it drink freely of ice water.

5. Keep your house sweet and clean, cool and well aired. In very hot weather let the windows be open day and night. Correct all foul smells by pouring into the sinks and privies carbolic acid or quick-lime, or the chloride of lime, or a strong solution of copperas. These articles can be got from the nearest druggist, who will give the needful directions for their use.

6. Breast milk is the only proper food for infants. If the supply is ample and the child thrives on it, no other kind of food should be given while the hot weather lasts. If the mother has not enough, she must not wean the child, but give it, beside the breast, modified cow's milk, as prepared under Rule 8. Nurse the child once in two or three hours during the day, and as seldom as possible during the night. Always remove the child from the breast as soon as it has fallen asleep. Avoid giving the breast when you are over-fatigued or over-heated.

7. If, unfortunately, the child must be brought up by hand, it should be fed on a milk diet alone—that is, warm milk out of a nursing-bottle, as directed under Rule 8. Modified cow's milk is the best, and next to it Eskay's Albumenized Food mixed up with fresh cow's milk. If the child thrives on this diet, no other kind of food whatever should be given while the hot weather lasts. At all seasons of the year, but especially in summer, there is no safe substitute for milk, if the child has not cut its front teeth. Sago, arrow root, potatoes, corn flour, crackers, bread, every patented food, and every article of diet containing starch, cannot, and must not, be depended on as food for very young infants.

8. Buy only whole milk known to be of good quality. Prepare either modified cow's milk or artificial foods exactly as directed under infant feeding. Keep bottles of food in a cool place, on ice, or if in the country and without ice lower a basket containing the filled nursing bottles in a well near the surface of the water. It is best to have the milk delivered during the early morning and have it prepared and sterilized before the day becomes hot.

9. If the milk should disagree, one-half to one tablespoonful of lime water may be added to each bottleful. Whenever pure milk cannot be gotten, try the condensed milk, which sometimes answers well. It may be prepared by adding to ten tablespoonfuls of boiling water, without sugar, one tablespoonful or more of the milk, according to the age of the child. Should this disagree, a teaspoonful of arrow root, sago or cornstarch may be cautiously added to a pint of the milk. If milk in any shape cannot be digested, try, for a few days, pure cream, diluted with three-fifths or four-fifths of water—returning to the milk as soon as possible.

10. The nursing-bottle must be kept perfectly clean; otherwise the milk will turn sour and the child will be made ill. After each meal it should be emptied, rinsed out, taken apart and the nipple and bottle cleansed in boiling water and placed in clean water, or in water to which a little soda has been added. It is a good plan to have eight or ten nursing-bottles, and to use them by turns. Then when food is prepared for the day each feeding can be placed in a bottle and kept ready for use in some cool place or in the refrigerator. The best kind is the plain bottle with a rubber nipple and no tube.

11. Do not wean the child just before or during the hot weather, or, as a rule, until after its second summer. If suckling disagrees with the mother she must not wean the child, but feed it, in part, out of a nursing-bottle, on such food as has been directed. However small the supply of breast milk, provided it agrees with the child, the mother should carefully keep it up against sickness; it alone will often save the life of a child when everything else fails. When the child is over six months old, the mother may save her strength by giving it one or two meals a day of modified cow's milk or some prepared infant food put into a nursing-bottle. When from eight months to a year old, it may have also one meal a day of the yolk of a fresh and rare-boiled egg, or one of beef or mutton broth, into which stale bread has been crumbed. When older than this, it can have a little meat finely minced; but even then milk should be its principal food, and not such food as grown people eat.

DEVELOPMENT OF THE CHILD.

Mothers, nurses and friends are often badly misinformed as to what constitutes a healthy, normal, full-term child, and often know less about what should be its natural development.

Weight.—The average weight of infants at birth is six and one-half pounds for a girl and seven and one-half pounds for a boy. Of course, great variations from this may occur. Children have weighed at birth but two and three-fourths pounds and have lived to develop into strong manhood, while, on the other hand, children have been born weighing as much as twenty-two pounds. During the first week after birth the infant loses steadily in weight. Sometimes a full pound is lost, usually not more than a half pound. After the first week there should be a steady gain of two to four ounces each week. The baby should frequently be weighed, and if it does not increase in weight some change of food should be made.

Length.—The average baby at birth measures twenty inches in length. At six months it should be twenty-four inches. At birth the trunk is longer in proportion than the body. The first growth is largely in the length of the legs. Growth usually occurs in cycles. While gaining rapidly in weight little is gained in length. While teething, or immediately after, the growth in length is marked.

General Development.—The fat, flabby child, such as we see when bottle-fed with condensed milk, or occasionally when breast-fed, is not a healthy child. An acute illness will be badly borne. Rickets, bow-legs and delayed teething are noted. The healthy child has pink skin, rounded limbs, with firm muscles. It is not necessarily fat. It is always active when awake.

Periods of Development.—For convenience the child's life may be considered as consisting of three periods: The first period extending from birth to the beginning of teething; the second, that of teething (milk teething); the third extends from the first teething to the end of the second teething.

During the first period breast milk is the ideal food. At this time babies cannot digest starchy foods, hence all table food, bread and the like, must be withheld. During the second period saliva is formed in the mouth and occasionally good broths may be given. During the third period the digestive apparatus is prepared for more complex food. See Special Diet Lists.

Exercise and Air.—Almost as important as food and bathing is that of exercise and air for the growing infant. Exercise for its muscular system can be secured by massage after the bath, and by dressing in such a way as to give the child the freedom of its limbs. It is of great importance that the child be taken in the fresh air and sunshine as much as possible. Only in inclement weather should this be neglected. A baby carriage is desirable for this purpose. A sun-bath given with the nude baby on a pillow inside a sunny window in winter and in the fresh air in summer is healthful. Nurseries should be large, airy and well ventilated, and should be located on the sunny side of the home. The heating plant should be so managed as to give an equal temperature of 72 degrees, with fresh outside air entering at all times.

TEETHING OR DENTITION.

Time of Teething.—The most usual age for an infant to begin teething is from the sixth to the eighth month. This is only a general rule. Bottle-fed babies, delicate infants and children with rickets, teethe later than the eighth month. Precocious infants may teethe much earlier. Children are occasionally born with one, two or more teeth; others have no teeth until the eighteenth month.

How the Teeth Come.—The lower central incisors usually appear first, and in a few weeks the four upper incisors follow. From the twelfth to the fourteenth month the remaining lower incisors and the premolars come through. There is a long delay preceding cutting of the incisors. They appear from the eighteenth to the twentieth month. The remaining molars appear about two and a half years of age. The full set of milk teeth numbers twenty, ten in each jaw. The accompanying diagram shows their appearance most graphically. It also shows the full set of teeth and the age at which they appear:

Convulsions.—Dentition is a physiologic process and should cause no serious disturbance to the health of the child. It is true that there may be considerable irritability of temper, and resulting from it some digestive disturbance. The dreaded convulsions of teething are very much overrated.

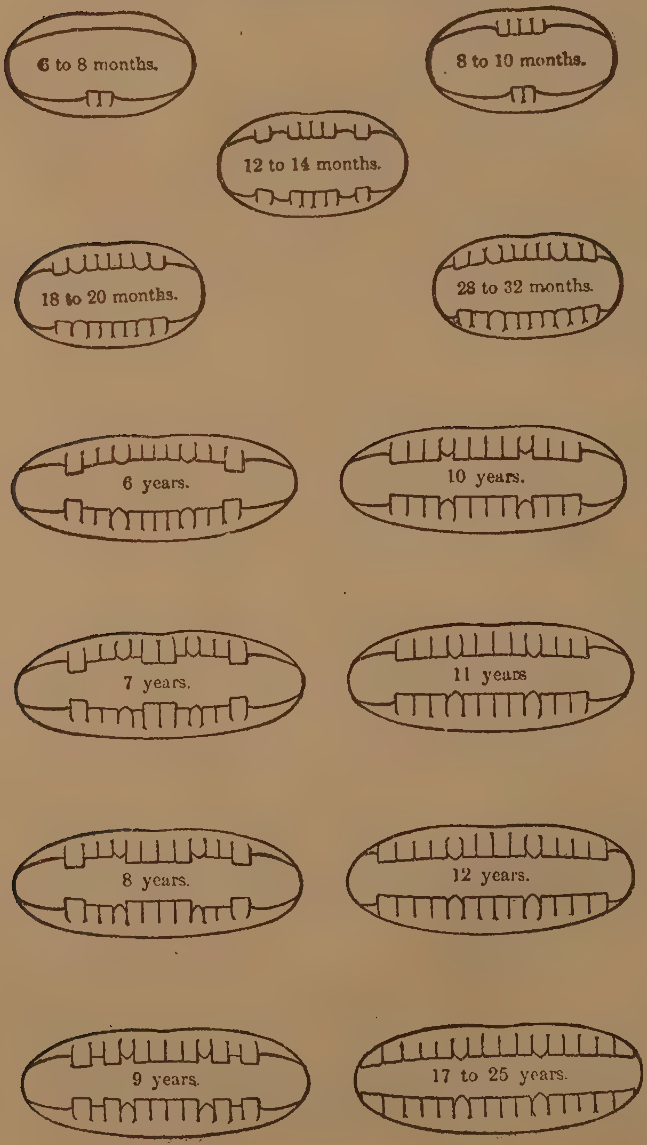
What to Observe in a Child.—The most important points to be attended to in making up an opinion of a child's condition are the countenance, noting its expression, coloration, wrinkles, etc.; the sleep; the cry; the state of emaciation or fatness; the condition of the skin, as to eruptions, color, temperature, degrees of dryness, swelling, etc.; the pulse; the respiration; the signs furnished by the mouth and throat; the power of sucking; and, finally, the state of the abdomen.

Pulse Rate of Children.—

Young infants	100 to 102.
First year	115.
Second year	118.
Second to sixth year	Sleeping, 76; waking, 92.
Sixth to ninth year	Sleeping, 73; waking, 90.
Ninth to twelfth year	Sleeping, 72; waking, 80.
Twelfth to fifteenth year	Sleeping, 70; waking, 72.

In girls the rate is about five beats higher,

HOW AND WHEN FIRST TEETH COME.



Temperature of Children.—1. The daily range of temperature is greater in the healthy child than that recorded in healthy adults, amounting to 1, 2 or 3 degrees.

2. There is invariably a fall of temperature in the evening, amounting from 1 degree to 3 degrees Fahrenheit.

3. This fall may take place before sleep begins.

4. The greatest fall is usually between 7 and 9 P.M.

5. The minimum temperature is usually observed at or before 2 A.M.

6. Between 2 and 4 A.M. the temperature usually begins to rise, such rise being independent of food being taken.

7. The fluctuations between breakfast and tea time are usually trifling in amount.

8. There seems to be no very definite relationship between the frequency of the pulse and respirations and the amount of the temperature, the former being subject to many disturbing influences.

Respiration in Children.—The average frequency of the breathing in new-born children and during the first week of life is thirty-nine times per minute. It may rise, however, upon very slight disturbances, to fifty, sixty or eighty. In perfectly healthy infants, during sleep the respiration may fall to twenty-five per minute.

Between 2 months and 2 years the average number of respirations per minute is 35.
Between 2 years and 6 years the average number of respirations per minute is 23.
Between 6 years and 12 years the average number of respirations per minute is 22.
Between 12 years and 15 years the average number of respirations per minute is 20.

Evacuations of a Child.—The healthy motion varies from a light orange yellow to a greenish yellow, and in number from two to four times daily.

Smell should never be offensive. Slimy, mucus-like, jelly motions indicate worms. Offensive, acid, pale-green motions indicate a disordered stomach. Dark-green evacuations indicate acid secretions and more serious stomach or bowel disorder.

Fetid, dark-brown stools are present in chronic diarrhœa. Putty-like, pasty passages are due to acidity curdling the milk or to torpid liver.

Amount of Sleep Required Each Day.—

At 4 months	20	hours of sleep is required.
At 6 months	18	hours of sleep is required.
At 1 year	15	hours of sleep is required.
At 2 years	13	hours of sleep is required.
At 4 years	12	hours of sleep is required.
At 7 years	11	hours of sleep is required.
At 9 years	10½	hours of sleep is required.
At 14 years	10	hours of sleep is required.

Infant Exercise.—Exposure of infants to pure air should begin in a very few weeks after birth; an hour or two a day at first, but daily whenever the weather permits. They soon evince a strong desire for the open air. When yet carried by the nurse they point to the door; when crawling they try to approach it; when walking they attempt to escape from the house to the air without. This, however, must not be construed into advice to carry out the child in unfavorable weather or for a long time, with an idea of hardening it. Catarrhal inflammations are easily produced in children.

Out-Door Playing.—When old enough to play and romp, the dress should not be so fine as to require an order of good care. Nothing affords more real enjoyment to children, and at the same time tends more decidedly to give them a sound and active tone of mind and body than a liberal indulgence in exercise and their innocent sports out of doors.

General Signs of Health.—"Rotundity is the beauty of youth." Dr. Meigs says of a healthful child: "Its tissues are firm and solid; its surface of a cool and pleasant temperature; its coloration of clear and exquisite white, firmly tempered with a faint rosy tint in a warm atmosphere, or slightly marbled with light bluish spots in a colder air. Few marks more certainly indicate a healthful temper of the constitution than the clear and exquisitely tinted pink color of the palmar and plantar surface of the hands and feet of a young child. Nothing indeed can be more beautiful or perfect in shape and contour than the figure of a fine, hearty young child; nothing more pleasing to the eye than its delicate but vivid coloring; and nothing more expressive of the fullness of health than its whole appearance." The movements and gestures of a child give a clue to its condition. Healthy children, when awake, are in almost constant motion, or at constant play.

Care of Older Children.—Skene has aptly said: "To begin life well, one must be born of parents who are sound in body and mind. After birth and throughout childhood, or to make them better or worse than themselves, according to the kind of care and culture bestowed."

Diet.—"Food is the primary necessity in raising children; the character, quantity and time of administration should each have the scrupulous attention of all those who are responsible for the welfare of children." Dr. A. Jacobi says: "Children not only eat to live, but eat to grow also." Children need to be fed oftener than adults. The growing boy and girl each require a relatively greater quantity of food than the adult. The best results are to be gotten by a mixed animal and vegetable diet.

The following is a useful summary (taken in part from Holt) of

GENERAL RULES FOR FEEDING YOUNG CHILDREN.

1. Allow time for meals.
2. See that the food is thoroughly masticated.
3. Do not allow nibbling between meals.
4. Do not tempt the child with the sight of rich and indigestible food.
5. Do not force the child to eat against its will, but examine the mouth, which may be sore from erupting teeth; and examine the food, which may not be properly cooked or flavored. If good food is refused from peevishness merely, remove it and do not offer it again before the next meal time.
6. In acute illness reduce and dilute the food at once.
7. In very hot weather give about one-fourth or one-third less food and offer more water.

DIET FOR YOUNG CHILDREN.

The following diet lists are from Thompson's Dietetics, with slight modifications, and from Starr's and Holt's tables:

TWELFTH TO EIGHTEENTH MONTH.

7 A.M.—Stale bread soaked in a breakfastcup of new milk.

10 A.M.—Milk, six ounces, and soda biscuit, or a thin slice of buttered bread.

2 P.M.—Beef tea, six ounces, bread and a tablespoonful of rice and milk pudding.

6 P.M.—Same as first meal.

10 P.M.—A tablespoonful of Eskay's food in eight ounces of milk.

In alternation a lightly boiled egg, with bread crumbs and six ounces of milk may be given at 7 A.M., and at 2 P.M. a mashed baked potato moistened with four tablespoonfuls of beef tea; two tablespoonfuls of junket.

EIGHTEENTH TO THIRTIETH MONTH.

7 A.M.—New milk, eight ounces; the yolk of an egg lightly boiled; two thin slices of bread and butter, or else milk, and two tablespoonfuls of well-cooked oatmeal or wheaten grits, with sugar and cream.

11 A.M.—Milk, six ounces, with a soda biscuit or bread and butter.

2 P.M.—One tablespoonful of rare mutton pounded to a paste, bread

and butter, or mashed potatoes moistened with good dish gravy, a saucer of junket; or else a breakfastcupful of beef tea or mutton or chicken broth, a thin slice of stale bread, a saucer of rice and milk pudding.

6.30 P.M.—A breakfastcupful of milk, with bread and butter, or soft milk toast.

TWO AND A HALF TO THREE AND A HALF YEARS—i. e., for Children Who Have Cut Their Milk Teeth (Starr).

7 A.M.—One or two tumblers of milk, a saucer of thoroughly cooked oatmeal or wheaten grits, a slice of bread and butter.

11 A.M.—If hungry, a tumbler of milk or a teacupful of beef tea, with a biscuit.

2 P.M.—A slice of underdone roast beef or mutton, or a bit of roast chicken or turkey, minced as fine as possible; a mashed baked potato moistened with dish gravy, a slice of bread and butter, a saucer of junket or rice and milk pudding.

7 P.M—A tumblerful of milk and a slice or two of soft milk toast.

FROM THREE AND A HALF YEARS UP (Starr).

Breakfast.—Every day: Milk, porridge and cream, bread and butter. One dish only each day: Fresh fish, eggs lightly boiled, eggs poached, eggs scrambled, eggs (plain omelet), chicken hash, stewed kidney, stewed liver.

Sound fruits may be allowed before and after the meal, according to taste, as oranges without pulp, grapes (seeds not to be swallowed), peaches, thoroughly ripe pears and cantaloupes.

Dinner.—Every day: Clear soup, meat roasted or broiled and cut into small pieces, bread and butter. Two dishes each day: Potatoes baked, potatoes mashed, spinach, stewed celery, cauliflower, hominy, macaroni (plain), peas, string beans (young), green corn (grated).

Junket, rice and milk or other light puddings and occasionally ice cream may be allowed for dessert.

Supper.—Every day: Milk, milk toast or bread and butter, stewed fruit.

From the third to the fifth year the child has twenty teeth, and often three meals a day suffice, although from the third to the fourth year four may be given.

When the second set of teeth begin to replace the deciduous or milk teeth, which gradually decay, digestion is sometimes interfered with temporarily from lack of ability to masticate thoroughly, and the food should be thoroughly subdivided before it is offered to the child.

Cereal Food.—Bread, rice, oatmeal and other cereal foods should always enter largely into the dietary of healthy children after they are able to digest them. Their fats should be derived chiefly from butter and cream. The best fruits for them are oranges, cooked apples and stewed prunes.

Holt's Sample Diet.—Children between three and four years of age should be fed when in health four times a day—at 7 A.M., 10.30 A.M., 1.30 P.M. and 6 P.M.

The following is "Holt's Sample Diet for a Child Four Years Old:"

First Meal.—Half an orange, one and a half teaspoonfuls of oatmeal or hominy, well salted, with two tablespoonfuls of cream, but no sugar, and one glass of milk.

Second Meal.—A glass of milk or cup of broth and one slice of stale bread.

Third Meal.—Meat—either steak, chop or chicken—one green vegetable (e. g., spinach), one starchy vegetable (e. g., potato), water to drink, stewed prunes for dessert.

Fourth Meal.—Bread and milk or milk toast.

FOODS FORBIDDEN TO ALL YOUNG CHILDREN (Thompson).

Indigestible Foods.—The following articles are particularly indigestible for children, and should not be allowed them under four years of age, and most of them should not be given under seven or eight years: Fried food of all kinds, game, salt food, the flesh of swine in all forms (pickles, salads, condiments, except salt), "stews," the "dressing" of fowl, sauces, visceral foods (such as liver, kidneys, tripe, etc), all raw vegetables, potatoes (except baked), tomatoes in any form; the coarser vegetables, such as beets, turnips, cabbage, and so forth; fancy bread, cake and pastry; griddle cakes, canned food of all kinds; fancy confectionery, sweets and preserves; cheese, rich soups, jellies, dried or unripe and overripe fruits (bananas, so often given to young children, are very bad for them), nuts, fruits with large seeds, such as grapes, the skin of all poultry, fruits or vegetables.

Good Cooking.—All food should be plainly and thoroughly cooked. No greasy or highly seasoned dishes are permissible, and, as a rule, twice cooked meats are indigestible.

Forbidden Drinks.—Tea, coffee and alcohol in every form must be withheld. The two former beverages interfere with digestion and make the child nervous, and the latter lays the foundation for a permanent alcohol habit. Soda water with syrups should not be given. Too much water should not be allowed with meals, and what is given should not be ice-cold.

Regular Meals.—Children, as they grow up, should continue to observe regularity in the hours for taking meals, and the habit of perpetually nibbling at cake, crackers and confectionery between meals should not be tolerated. It is best for young children not to be put to sleep immediately after their most substantial meal of the day. As they require a nap in the early afternoon, many advise giving this meal at 4 P. M.

When to Enter School.—The age at which any given child may enter school must be decided for that child alone. The individual must be considered. As a rule children are sent to school too early. Strong, robust children may be sent to school at six or seven years of age. They may even have spent two years in the kindergarten before reaching that age. On the other hand a delicate child had better be kept in the open air and sunshine until nine or ten years of age, or even later. It is far more important to every child to have a sound body than for it to have an educated brain.

Development of Puberty.—Puberty is that time of life in a boy or girl when they emerge from boyhood or girlhood into manhood or womanhood. It is a time in the life of most individuals fraught with danger. To the boy approaching puberty, little care need be given except to surround him with good influence and moral companions. The father had best perhaps tell him something of the change which will occur, and teachers should be patient in cultivating the voice. Singing should not be indulged in until the "new voice" is well established. The boy should be watched so that no bad habits are formed. This period is reached in the average boy in from the fourteenth to the sixteenth year.

Puberty in Girls.—In girls, puberty is reached about the fifteenth year. At this time the mother must seek the girl's closest and strictest confidence. It is well in some cases that the mother should tell the girl something of this change which will occur. She must do no severe mental work at this time, neither shall she indulge in violent exercise. When weary and languid, encourage rest in a reclining posture, with short walks in sunshine and fresh air daily. Many girls are better removed from school. The health and future usefulness of many girls are endangered, some even ruined, by injudicious care at this period. Moral companions must be secured at this period of life.

HEALTH AND CARE OF THE MATURE AND AGED.

Preservation of Health.—The preservation of health is sought by all wise persons, and the sweeping advances made by medicine in the past century, together with the better understanding of the masses, makes it possible to lessen disease, to minimize its evil effects, and to preserve the separate organs from involvment.

Patients Must Assist.—An educated physician has wonderful powers, but he can use but half his knowledge if he has no assistance from the patient or the patient's family. The physician recommends certain foods and advises against certain habits. An intelligent man will follow this advice to the letter. As regards many conditions, the reader can find ample advice in these pages.

Moderation.—All through life one word sums up the rule which all should heed. That word is moderation.

Temperance is almost a synonym.

Be temperate in food as well as in drink; in excercise and in work; even in sleep and rest, moderation is the word.

Effects of Immoderation.—Too much meat, too much pastry, too much tea or coffee, too little sleep, too heavy work and the blood is surcharged with deleterious material which is deposited in the various organs and tissues of the body and premature old age comes on, or the organs fail to functionate, and death comes years ahead of its time. Even in acute illnesses which are determined in their course in the first few days of the disease, constitution plays a most important part. This constitution may be inherited—a cause for congratulation—or it may be acquired.

Healthy Ancestry.—To obtain a good physique one should have healthy ancestors. For this purpose—to insure as healthy an ancestry as possible to coming generations—the most intelligent men of our times are agitating the passage and enforcement of laws prohibiting the marriage of the physically or mentally unsound.

Inherited Consumption.—Consumptives should not marry, or if they marry, should not create or bear children to inherit the weakened constitions and to look forward to the same early and revolting death that their parents have had.

Care in Inherited Consumption.—If, on the other hand, such a family history has preceded one's advent into this world, attention to every detail in the development of the body and to maintaining that condition of health which results, will usually lengthen the days and the reward will be worth all the struggle and effort. Climate, an outside life, temperance in all things, and the careful trial and development of the weakened parts of the body are essential to improvement.

Criminals Should Not Have Children.—That criminals should not create offspring is most widely accepted. How to prevent this is the question that has excited discussion for several decades among learned men. That the vast majority of our criminals are the children of other criminals is acknowledged.

Children of Criminals.—A large number of their children are epileptics or idiots. With this horde of "misfits" in the community, there is a constant drag backward on the wheels of progress. Emasculation is the remedy most certain, and is offered by the most enlightened and advanced men in the world, but few among the masses are prepared to accept so severe a measure. Many people fail even in this day to realize that duty to mankind is above duty to individual man.

Cleansing the World of Disease.—The above paragraphs—on consumption and on criminals—are but hints to the thinking, and if followed to their natural conclusion will demonstrate the necessity of cleansing the world of disease by allowing those who are afflicted to live out their lives as comfortably and as happily as they can, only prohibiting them from perpetuating their kind, which they should have no desire to do anyway if they realize the sort of offspring that will surely be given them.

Care in Different Stages of Life.—In the third decade of life many excesses in work or in dissipation may be indulged in without any immediate ill resulting, but the fourth or at latest the fifth decade will show that all excesses must be paid for to the full. I do not mean to encourage laziness, for activity in business and in pleasure is as useful as can be.

Value of Recreation.—Vacations are a help and should be spent away from one's work and among new and novel scenes. Recreation from work and worry helps to lengthen one's days. Brain workers especially must throw off completely all thoughts of their work at frequent intervals and refresh their minds, and thus their bodies, with new or entirely different occupations. The return to work will reveal an increased power and interest.

Value of Sports.—Golf, hunting, fishing, and the various simpler sports are of value to a mature man or woman, acting both mentally and physically toward the well-being of the individual. No one should consider themselves old so long as they can possibly enjoy the milder sports of life.

Some men are young at seventy—yes, even at eighty—while some are old at sixty. "A man is as old as his arteries," says someone, and it is true that some men are older at thirty than others are at fifty.

Avoid Worrying.—Don't worry. It ages yourself and all your friends. A woman who thinks herself a compact bundle of symptoms looks old, is old, but unfortunately does not die soon enough to allow her friends to enjoy a little youth.

Sunshine and Air.—A clean life, avoiding excesses of all kinds, with as much open air and sunshine as can be had will give the adult, as well as the child, the best chance for health and long life.

THE AGED.

Prolonging Life.—In olden times the alchemists claimed to have discovered the elixir of life. They said that old age might be retarded and life greatly prolonged by means of an elixir having the power of preventing or suspending physical decay.

The possibility of prolonging life has in all ages been noticed by great thinkers.

The Organs in Old Age.—The latest scientific knowledge in regard to this subject may be stated as follows: The principal characteristics of old age, as demonstrated by anatomical research, are a deposition of fibrinous, gelatinous, and earthy material in the system. Every organ of the body, during old age, is especially prone to ossific deposits. The earthy deposits have been found to consist primarily of phosphates and carbonates of lime combined with other calcareous salts.

Bone Hardening in Old Age.—Man begins in a gelatinous and ends in an osseous or bony condition. From the cradle to the grave a gradual process of ossification is undoubtedly present; but after passing middle age the ossific tendency becomes more markedly developed until it finally ushers in senile decrepitude. These earthy deposits during old age materially interfere with the due performance of function by the organs; hence we find imperfect circulation in the aged; the heart gradually becomes ossified; the large blood-vessels blocked up with calcareous matter, and nutrition hindered.

Changes Which Produce Old Age.—"If repair was always equal to waste, life would only terminate by accident." It is the opinion of eminent scientists that the majority of all who pass sixty-five years suffer more or less from these ossific deposits. Therefore, bearing these facts in mind, it is plain that the real change which produces old age is, in truth, nothing more nor less than a slow but steady accumulation of calcareous matter throughout the system; and it is owing to these deposits that the structure of every organ is altered, elasticity thus giving way to senile rigidity. Blockage of various organs is thus commenced, and sooner or later a vital part becomes involved, and death of necessity follows. The idea that old age was brought about simply, or at all, by a decline of the vital principle, has long since been discarded by scientists, and the true cause found to be that of gradual disintegration of the tissues because of the inadequate supply of blood.

The feebleness of old age, therefore, being due to nothing more nor less than ossific deposits, it is well for a moment to look for the causes and influences leading to the condition described.

THE CAUSES OF OLD AGE AND THEIR AVOIDANCE.

The two principal causes of old age are, first, fibrinous and gelatinous substances; and second, calcareous deposits. According to recent researches, the origin of the first, the fibrinous and gelatinous, may undoubtedly be traced to the destruction of atmospheric oxygen.

Fibrin Blockades Life.—Although unquestionably fibrin nourishes the organs of our body, yet it becomes at times, as we reach the cool and shady walks in the evening of life, accumulated in redundant quantity, blockading the streams of life as do the chilling winds of winter the mountain rivulets.

Proportion of Chalky Matter.—The calcareous deposits are proved to be caused by gradual deposition from the water which forms so large a part (70 per cent.) of the human system, and to be introduced by means of food.

Foods and Chalky Matter.—As a matter of fact, everything we eat does contain these calcareous matters to a greater or less degree. The cereals are found most rich in them; so bread itself, the so-called staff of life, except in great moderation, most assuredly favors the deposition of these salts in the system. The more nitrogenous our food, the greater its percentage of calcareous matter; thus a diet composed principally of fruit, from its lack of nitrogen, is best adapted for preventing or suspending ossification.

Effects of Overeating.—Moderation in eating, then, must ever be of great value as an agent for retarding the advent of senile decay. Large eaters more rapidly bring on ossific deposits by taking in more than is utilized or excreted, naturally resulting in blockading the vessels and destroying their normal functions.

Best Foods for the Aged.—According to the best authorities, the following seem to be the best articles of food as containing the least of earthy salts: Fruit, fish, poultry, flesh of young mutton and beef; because, as before stated, they are much less nitrogenous. Fluids, as part of the diet, are of special import. All well and spring water contains considerable of the earthy salts, and should therefore be avoided and cistern water used in its stead, because water is the most universal solvent known.

How to Dissolve Salts.—Therefore, if when taken into the system clear of foreign matter, it is to that extent the better prepared to dissolve and take up those earthy salts and convey them out of the system. The addition of fifteen or twenty drops of dilute phosphoric acid to the glass of water, and drunk three times a day, will add to the solubility of these earthy salts.

RULES FOR THE CARE OF THE AGED.

1. The aged should not endeavor to perform the feats of agility, strength, endurance, and "of digestion," which were once their pride, especially during the extreme heat of summer.

2. The aged should avoid torpor of the bowels and constipation. Straining at stool may cause apoplexy.

3. Do not give up all mental and bodily work.

4. In the chill of any evening, or of early autumn, the aged need fire. Many an otherwise long life is cut short from neglect of this rule, by an attack of some form of lung inflammation.

5. Life can be prolonged, without a doubt, by a proper change of climate and of scene. The flickering flame of life can be protected from going out by a careful hand.

6. All warnings of weakness, or on-coming sickness, or decay, should at once be noticed by the aged, and due precaution and proper treatment instituted at once.

FOOD IN OLD AGE.

What Food to Avoid.—We eat to live or should eat to that purpose and as one grows old there is all the greater demand from Mother Nature that he adhere to this rule. Sir H. Thompson, in his book on Diet in Relation to Age and Activity, says that if a man past his half century of life "continues to consume the same abundant breakfasts, substantial lunches and heavy dinners which at the summit of his power he could dispose of almost with impunity, he will in time either accumulate fat or become acquainted with gout or rheumatism, or show signs of unhealthy deposit of some kind in some part of the body-processes which must inevitably empoison, undermine, or shorten his remaining term of life. . . . The typical man of eighty or ninety years is lean and spare and lives on slender rations."

Three Diet Rules.—Prof. W. Gilman Thompson, M. D., of New York, in his classic work on dietetics gives three rules to be observed in the dietetic treatment of old age. These are:

"1. To diminish the total quantity of food ingested.

"2. To give food at frequent intervals in small amounts.

"3. To give only digestible food, which does not produce too large a residue of waste matter, either in the intestinal canal or in the form of excrementitious material in the blood."

A Nature Hint.—Meats and tough vegetables are to be avoided and Mother Nature gives us a hint of this by taking away our teeth. This does not mean that the aged are to be kept on a fluid diet, for mastication is of use in promoting the salivary flow.

Liquid Tonic.—"Malt liquors are very good for the aged, and a moderate amount of alcohol acts as a tonic and supplies them with needed energy for digestion and other functions."

Minced Foods.—Yeo's suggestions as to diet in the aged are worthy of quoting in full:

"Of animal foods best suited for this time of life the following may be mentioned. When the organs of mastication are altogether inefficient these foods should be minced or pounded into a paste or otherwise finely subdivided:

List of Foods for the Aged.—"1. Young and tender chicken and game and other meats.

"2. Potted chicken, game and other meats, sweetbread.

"3. White fish, as soles, whiting, smelts, flounders, and so forth. Best when broiled.

"4. Bacon, grilled; eggs lightly cooked or beaten up with milk, and so forth.

"5. Nutritious soups, such as chicken purees, or fish purees, beef tea, mutton and chicken broths.

"6. Milk in all forms, when easily digested.

"7. Beef tea and milk supply the needed mineral substances, and the former is an excellent stimulant.

"8. The addition to milk of an equal quantity of Vichy water, warm, or of warm water, will often help to make it agree.

Vegetable Food.—"1. Of vegetable foods the following are all suitable.

"2. Bread and milk made with the crumbs of stale bread and without any lumps.

"3. Porridge and oatmeal gruel.

"4. Puddings of ground rice, tapioca, arrowroot, sago macaroni with milk or eggs and flavored with some warm spices, or served with fruit juice or jelly; bread and butter, at least a day old; rusks for soaking in tea, or milk, or water.

Artificial Foods.—"1. Artificial foods, consisting of predigested starches. The digestive ferments are scantily provided by the digestive organs at this age, and soluble carbohydrates are valuable for maintaining the body heat.

"2. All farinaceous foods should be submitted to a high temperature for some time so as to render the starch granules more easy of digestion.

"3. Vegetable purees of all kinds may be taken in moderation—*e. g.*, potatoes, carrots, spinach and other succulent vegetables.

"4. It is important that the use of potatoes and fresh vegetables should not be neglected; otherwise a scorbutic state of the body may be engendered.

"5. Stewed celery and stewed Spanish or Portugal onions.

"6. Stewed or baked fruits and fruit jellies and the pulp of perfectly ripe raw fruits in small quantity.

Counteracting Acidity.—"The acidity of certain stewed fruits may be advantageously neutralized by the addition of a little bicarbonate of soda so as to avoid the use of a large quantity of cane sugar to sweeten it, as this is apt to cause gastric fermentation and acidity. In stewing fruit about as much soda as will cover a shilling should be added to each pound of fruit.

Use of Condiments.—"Aged persons often require their foods to be accompanied with some kind of condiment, which promotes their digestion and prevents flatulence.

"Caviare and the roes of smoked and salted herrings are of this nature.

Sweetenings.—"For sweetening food milk sugar is much less prone to excite acid fermentation than cane sugar.

Digestible Form of Fat.—"A very digestible form of fat, when it is needed, is cream mixed with an equal quantity of hot water and about ten drops of sal volatile to each fluid ounce."

General Diet Required.—It is but fair to all concerned that I submit the teachings of Dr. J. Boy-Teissier, of Marseilles, who, in the most recent and complete work on this subject, handles the theme and the patient in a different manner entirely. As to diet, he says: "I do not think that a special diet is necessary. We must not forget that the normal old man is not a patient; all the functions of the adult exist also in the old man, only in a diminished degree; the functions are the same, but their activity only is lessened. . . . We must regulate the quantity of food and adapt it to the degree of senilization. . . . . It is useless and even dangerous in the case of old people to try to maintain the strength at high point by means of alimentation.

A Diet of Maintainance.—"In a general way, having no longer an active life to lead, the old man has need merely of a diet of maintainance . . . watch . . . over the performance of the excretory functions; as long as the weight does not vary, and as long as the urea represents the quantity of nitrogen contained in the food we may regard it as certain that there is a perfect equilibrium and that the alimentation of the old man is sufficient."

Cautious Use of Wines.—Boy-Teissier does not subscribe to the saying that wine is the milk of the aged, but advises great caution in its use.

The Aged Should not House Themselves.—This same author advocates plenty of fresh air for the normal old man. So many old people house themselves up and shut out from their blood the pure aid which they need even more in their old age than when younger. If diseases of the lungs forbid exposure, heed should be given, but the normal old person should have fresh air, and also all the sunshine he can get.

Clothing of the Aged.—The clothing should not be heavy, but rather light. It should, however, be warm and comfortable. Bundling should be avoided in the latter days as in all the other days of life. The warmest place in the chimney has always been reserved for the grandparent, but this is a mistaken kindness, for it only increases his tendency to inaction.

Muscular Exercise.—To counterbalance this tendency to inaction, which means a retarding of the combustion of the products of nutrition, muscular exercise should be insisted upon. Care should be had lest this be overdone, but the old man should be forced to exercise.

Medical Care.—I have written here of normal old age, and it is the old age we all look forward to. Few attain it and those who grow old with some organs of the body more advanced in the aging process than others, find that they need almost constant medical supervision to help them live longer and to be more comfortable while they live.

Natural Death.—"Above all modes of dying is that which we must call natural death, physiological death, that which necessarily and happily terminates existence. This death is gentle and calm, for it is free from all painful manifestations; it is, therefore, desirable, and all our efforts ought to be directed to its attainment. We should try to have it accepted as a happy event. . . . I have not to occupy myself with the value of life. Most commonly, I believe, it is worth only what we make it worth.

When Death is Welcome.—"But after having seen that all the vital phenomena have fulfilled their evolution, we may justly believe that this final act, that which is accomplished naturally, without our having had any responsibility in its hastening or retardation, that which terminates the series of organic acts, ought to be regarded as welcome."—*Boy-Teissier.*

CARE OF THE EYES.

To take proper care of the eyes is to do all we can to avoid such diseases as are avoidable. To do this we should know something about the eye and its diseases, descriptions of which have been given in Book IV—Part IV.

Near-Sightedness.—Boys often discover their near-sightedness by finding that their playmates can read signs and see clocks and faces at much greater distances than they can. Near-sightedness is a growing defect among young people and may be corrected in part by looking at distant objects in the heaven or on the ocean.

Weak Sight.—Fatigue of the eyes during or after the use of them is the first symptom of weak sight. This is more noticeable at first after reading, writing or sewing in the evening; soon the same fatigue is noticed after similar occupation in daytime. In time this fatigue comes on immediately after attempting to read or sew, and, if work is continued, pain and confusion of vision follow; letters run together, lines are blurred and indistinct. Weak sight is simply a disorder of the muscular apparatus of the eyes.

There are four striking symptoms by which we may judge that the eyes are being injured:

1. Redness of the eyelids and balls.

2. Pain in the eyes.
3. Indistinct or imperfect vision.
4. Frontal or other headaches.

In health the muscles act in perfect harmony, but if these muscles are overworked, fatigued or sensitive, they do not act harmoniously and weak sight is the result.

Never Use Imperfect Light.—Never use an imperfect light. What is an imperfect light?

1. Deficient amount of light, as in the early morning or twilight, or an artificial light far distant, or a very small artificial light, or light far from a window which is too small for the room and for a dark day. When the light is such as to render it difficult to see the work or print before us a proper regard for the preservation of vision will compel the immediate stopping of the work.

2. Light may be imperfect from its unsteadiness. It is this quality that renders the electric light harmful to vision. Gas light often exhibits a degree of flickering very trying to the eyes.

3. The light may be steady but the car or carriage in which we are seated may move. The attempt to read in the cars is a fruitful source of injury to the eyes.

4. The practice of reading while in a reclining position upon a lounge or in a bed causes the light to enter the eye at such an angle as to require an undue amount of effort in order to see distinctly for a long time. Such a position should always be avoided.

When possible the light should fall upon the printed page or upon our work from the left side of the body and from behind the shoulders.

How to Preserve Good Sight.—1. Act as if the eyesight were of more importance than any other thing on earth.

2. Have your child's eyes carefully examined by an expert before it is given specific tasks to perform calling for the full exercise of healthy eyes. If the eyes are found defective then grade the tasks according to the nature of the defect.

3. Never use the eyes when such use causes pain in these organs or in the head.

4. Never use the eyes when imperfectly supplied with blood, as before breakfast, when exhausted after a severe illness, and so forth.

5. Never use the eyes for close work in an imperfect light.

6. Avoid the excessive use of alcohol and tobacco.

7. Heed the warning given by redness of the eyelids and of the

whites of the eyes; by pain in or about the eye; by the continuance of indistinct vision for any considerable time.

8. Regard the eyes as part of a very complex system of apparatuses, the best health of all being absolutely needful for the best health of each.

9. Remember that we do not see with the eye, but with the brain. Hence after the brain is exhausted it is impossible to really see.

Use of Spectacles and Eye-Glasses.—Weak sight is very often due to defective form of the eyeball itself, it being too flat, too full, or of irregular form. In cases of defective eyeballs, beside following the advice given above, the imperfect shape must be neutralized by the scientific adaptation of spectacles. It is quite wrong to depend upon your own judgment in this matter or to procure your glasses from a traveling peddler of spectacles. For elderly people, spectacles are usually preferred to eyeglasses, except for occasional use. For long use, spectacles are more comfortable.

Blue or smoked glasses in weak sight, when there is much dread of light. Their use should be confined chiefly to wear in bright sunlight on the snow, sand or water. For reading, colored glasses should not be too dark in tint, as too much exertion is required to see clearly through them.

Contagious Eye Diseases.—It should be borne in mind that diseases of the lids or eyes attended with a pus discharge are contagious. Those suffering with such a disease should be kept apart from others and great attention should be paid to cleanliness. Towels and washing material should not be used in common.

Common Eye Accidents.—Those who work where splinters of metal or stone are liable to strike the eye should wear spectacles at their work. Spectacles of ordinary glass are a good protection against cinders in traveling. Eye-stones are nothing but smoothly-worn pebbles. It is not best to use them. It is not common-sense treatment to cure an irritable eye, suffering from a foreign body, by placing another foreign body therein.

Removing Cinders.—A cinder or other foreign body may often be displaced by quietly and steadily looking downward at your feet, letting the tears that form wash out the irritating substance. If the foreign body sticks on the ball it sometimes can be readily wiped off with a piece of paper twisted to a lamp-lighter shape or the free end of a common match. If it does not come off easily professional aid must be secured as great harm may be done the beautiful, transparent front of the eye by the use of sharp instruments in unskilled hands.

If quick-lime or mortar has fallen into the eyes, the best plan is to drop in some olive oil at once. The eye then may be washed out with warm water to wash away all the particles of lime. This can be best done with a small syringe. If acid has gotten into the eyes use milk and water at once and in the same manner.

CARE OF THE EAR.

Prime Rules.—1. Act as if hearing were of more importance than any other thing on earth.

2. Refrain from use of the ear when it causes pain, choosing quiet places and deadening sound by the use of cotton plugs.

3. Avoid all such injuries to the ears as result from slapping, pulling, and very loud and sudden noises.

4. Keep out of the external ear all things smaller than the forefinger, or stiffer than a towel or handkerchief.

5. Keep out of the ear all oils, all soaps, all cold water and everything else recommended by kind but mistaken friends; especially never apply a poultice to the ear for the relief of pain. Dry heat will do all that moist heat can do to relieve and be free from the danger of absolutely destroying the drum of the ear.

Cleansing the Ear.—In health, the deeper parts of the ear can be left to take care of themselves. The orifice of the canal is to be cleansed in precisely the same manner as any other depressed portion of the surface of the body—that is, with a wet sponge or cloth.

CARE OF THE SKIN.

Every-day Washing.—Every-day washing should be the rule the year round, but particularly so in summer. Ablution of the person sufficient for cleanliness may easily be made to act also as a proper stimulant by using a rapid sponge bath, followed by quick rubbing for a few moments with a towel of such texture as can be borne without irritation. The skin will not bear the frictions of a lintish towel so well in summer as in winter. Invalids should avoid chilling the body; simple and generally healthful as bathing is it cannot be trifled with. Many a good man or woman has unwittingly committed suicide with water.

Daily Attention to Feet.—If the person is very feeble and very sensitive to the application of water such a one can attend to one part of the body one day and another the next. It is well, however, to give daily attention to the feet. The feet perform a large part of our bodily labor, and the excretion from them is so great that particular care should be taken to keep them clean. Warm sponging followed by friction is more suitable for cleansing the skin of dirt and for the delicate invalid and child.

Use of Soap.—The amount of soap used in the toilet depends upon the delicacy of the skin and the exposure to which it has been subjected. Those who have oily skins depending upon well-developed and active oil-glands require much more soap than those having harsh and dry skins lacking in oily secretion.

Cautious Use of Soap.—Daily application of soap to the face is not necessary unless one is exposed to considerable dust and dirt. Hot water and a coarse wash-rag with thorough rubbing and followed by cold water and more thorough rubbing will stimulate the skin and make it healthier than the excessive use of soap to remove invisible dirt. Many cases of "black-heads" and postular eruptions of the face have been benefited by stopping the use of soap on the face.

Removing Face-Shine.—Clean fine white velvet is an elegant substitute for powders to remove the shine on the face. Chamois skin is used for the same purpose.

Cosmetics.—Cosmetics are substances applied to the skin, hair, teeth, nails, and so forth, to improve their appearance. None of them are essential to health; the great majority are positively harmful. Health and strength give the beauty that is appreciated by all men and women of refinement.

CARE OF THE HAIR.

Attention to the Scalp.—The preservation of the hair depends upon a number of things and chief of these is the condition of the scalp which is the soil in this case. The scalp should be thick and movable and massage will help to develop this part of the body as it does other parts. So shampooing does double duty, cleansing and massaging. The brush does the same work in a different way and neither should be neglected.

Cleansing the Hair.—Cleanliness is the first requisite in the management of the hair. There is no danger that the scalp will be washed too often. Shampooing should be done as often as the hair is dirty. At least once a month the head should be thoroughly washed and the hairs cleaned down to their roots. Any good soap may be used but there is not one that is purer than the white castile. Tincture of green soap is a reliable and satisfactory soap.

Brushing the Hair.—The hair should be brushed several times a day, at least in the morning and evening and for several minutes at each time, until there is a feeling of warmth in the scalp. Adults should use a stiff brush and children or those with thin hair or a tender scalp a soft brush. Never brush hard enough to make the head sore.

Good Combs.—Combs should be preferably coarse and used to disentangle the hair, not to cleanse it. The teeth should be well made and not ragged as they will then tear and pull out the hair. Never try to comb dandruff out of the hair. It should be brushed out or washed out.

Crimping.—Crimping the hair causes it to break and crack. This may be a matter of considerable importance in elderly women in whom the hair is beginning to fall and thin out, for this will hasten the fall and cause more or less baldness.

Grayness.—Women usually preserve the color of the hair longer than men. Fair hair falls out sooner than black but does not become gray so soon. Premature grayness of the hair is often produced by debility, anxiety or severe illness.

Baldness.—If from any cause the hair papilla becomes diseased or debilitated it either ceases to produce the hair or each successive hair becomes shorter, finer and more brief in its life, until, finally, atrophy of the hair follicles occurs and the hair is dead. Under ordinary circumstances the hair of the head begins to thin out between the ages of thirty and forty and this thinning proceeds slowly but steadily during the rest of the individual's life. Those who are affected with dandruff should pay immediate attention to the condition, otherwise the hair will begin to fall out and baldness results. Baldness can occur without the occurrence of dandruff, and, again, the hair remains thick and strong in some persons whose heads are full of dandruff. The baldness occurring in connection with fevers, skin diseases of the scalp, and so forth, is only temporary; the bulbs are not destroyed and the hair is again reproduced. In elderly persons, after sickness, the hair may not return to its full former condition.

Hair Invigorators.—When the falling of the hair has been caused by some fever or other illness the remedies used for relief are stimulants—something to increase the blood supply to the scalp. These are called hair invigorators. We would caution the reader against the use of all patent, advertised hair remedies. A simple and harmless "invigorator" is as follows:

Formula for a Good Hair Invigorator.

Cologne water	2 ounces
Tincture of cantharides.........................	2 drachms
Oil of lavender.................................	10 drops
Oil of rosemary.................................	10 "

Use once or twice a day. If it makes the scalp a little sore, discontinue its use for a short time.

To Cleanse Hair of Dandruff.—Rub in well the yolk of an egg. Wash out with castile soap, rinse with cold water and dry well. The egg combines with the grease and dirt and gives the scalp a thorough cleansing.

A Good Wash for the Hair.—

Vinegar	2	ounces
Salt of tartar	2	drachms
Spirits of lavender	½	ounce
Spirits of rosemary	1	"
Spirits of nutmeg	½	"
Essence of almonds	1	drachm
Essence of violets	1	"
Pure spring water	20	ounces

Mix and bottle for use. This makes, as well, a cool and refreshing perfume.

CARE OF THE TEETH.

Attention to the teeth should begin early in life, even during the period of first teeth. Decay of the "milk" teeth should be prevented and filling is just as important as with the permanent set. The temporary teeth must be removed in due time if they do not fall out themselves and the permanent ones must be trained to fill their places. The teeth should be cleansed five times a day—morning, bedtime and after each meal. A soft brush is better than a stiff one so as not to wound the gums. The best dentrifice is water; sometimes a little prepared chalk or white castile soap may be used. The too frequent use of powders containing cuttlefish bone or charcoal will injure the enamel of the teeth. When the gums are tender and tend to bleed add a few drops of tincture of myrrh to the water. Avoid all patent tooth powders and washes. It is a good rule to visit the dentist once each season to find out the exact condition of these important organs. Never lose a tooth if art can save it. The shape of the jaw and face is altered by the removal of teeth. When, by reason of a collection of tartar on the teeth a powder is desired for its removal, the following will be found useful and agreeable:

Tooth Powder.—

Precipitated chalk	12 drachms
Rose pink	2 "
Carbonate of magnesia	1 drachm
Oil of rose	5 drops

Mix all well together.

Care of the Mouth.—After the teeth have been cleansed, a valuable addition to the toilet is a mild and pleasant antiseptic mouth wash, which sweetens the mouth and by its action on disease-producing organisms purifies the mucous lining and acts against the decomposition of the food debris which the most careful attention to the teeth cannot completely remove.

Antiseptic Mouth Wash.—

℞.—Boric acid	10	grains
Resorcin	4	"
Salol	2	"
Thymol	½	grain
Glycerine	½	drachm
Pure water	1	ounce

Care of the Feet.—The feet are subject to many diseases, but the most common ones—ingrowing nails, corns and bunions—are due to neglect of a few simple rules which nearly all adults know. Fashion decrees that certain shapes must be worn and the poor foot, willing to toil and bear, is pressed and pulled out of shape by misshaped shoes.

Shoes.—1. Should be neither too large nor too small. They should fit snugly but comfortably all parts of the foot.

2. The heels should be placed well back under the human heel.

3. The soles should be reasonably thick. In winter heavy soles have many advantages that are apparent.

4. Patent leather and other forms of non-porous leather are injurious as they prevent the dissipation of natural sweat. The retention of this sweat increases the tendency to soft corns and to sore feet.

5. Slippers and low shoes are to be worn only in warm weather. They expose the blood at the ankles and so encourage colds.

The toe-nails should be cut regularly and carefully. Overshoes should always be worn in wet weather. Ladies often go without them in damp weather, relying upon the thickness of the soles of their shoes, and thus expose themselves to risks. A sheet of India-rubber is sometimes placed between the layers of leather in the soles of shoes, or felt or cork soles are placed within the shoe. There is no objection to these, providing they do not supplant the rubber overshoes.

Ingrowing Toe-Nails.—**Causes.**—Tight shoes and the cutting of the nails square are the causes. A tight sock may also be at fault. The skin is pressed over the sharp edge of the nail and ulceration results. The edge of the nail may become thickened or proud flesh may spring up at the point of ulceration.

Treatment.—"In mild or trivial cases the trimming or clipping of the free margin of the nail, scraping of the dorsal surface with a bit of glass or with a knife, so as to reduce its thickness and to produce a tendency to curling upward and backward of its lateral margins and the removal of any cuticle accumulated under the ingrowing edges of the nail are all that is required to give relief and prevent further progress. Pressure must be avoided. When ulceration has occurred a minute roll of lint shreddings should be neatly packed beneath the tender overhanging skin and ingrowing edge. Strapping is then applied so as to retain the lint and drag upon the overhanging integument and keep it pulled away from contact with the ingrowing edge. The lint may be removed in a few days and the space filled with boric acid, iodoform, lead nitrate, alum or zinc oxide."

In severe cases avulsion of half or all the nail is required. This is a sure cure and a favorite with many physicians.

Corns.—A common corn is caused by friction or irritation of the skin from tight, loose or otherwise ill-fitting shoes, hard, stiff leather, large wrinkles over the joints, high heels that pitch the foot forward and keep it constantly bearing against the leather over the toes, and shoes narrow at the toes. In such cases the skin thickens and hardens to protect itself from injury in just the same way that it does upon the hands or other parts of the body exposed to rough contact.

Treatment.—Ordinary hard corns, when young, may be removed by scraping up the callous skin about the borders and prying out carefully with a penknife. It must be remembered for the successful treatment of corns proper foot covering must be worn. The shoes must be soft and of proper fit. Only such means can effect a radical cure. Corn cures and plasters are but a vexation if the laws of hygiene are not obeyed. The important part of treating corns is to relieve the pressure. Persons ill with a long fever, confined to their beds, have found their corns gone on getting from bed.

If the corn is between the toes the sole should be extra wide so that cotton may be put between the toes to keep them apart. Dr. Keller (quoted in the "Therapeutic Gazette") advises that the foot be soaked in hot water for fifteen minutes before bedtime, this followed by an application of salycylic acid in collodion, one part to three. This is repeated for five or six nights, each time removing all dead tissues with a knife after bathing. A drop of castor oil well rubbed in every night helps greatly.

Bunions.—**Cause.**—The great cause of bunions is the wearing of short and narrow-toed shoes, making a constant tendency to enlarge, widen and project the joint of the great toe. Bunions may prove a menace to life, especially in those past middle life. Repeated inflammations may finally go on to suppuration and this leave an ulcer which is most tedious to heal. This ulcer in those past middle age is liable to lead to erysipelas and senile gangrene. Amputation of this part of the foot has been necessary in some cases.

Treatment.—This is usually soothing. The deformity can seldom be overcome. Comfortable shoes are the things to be considered. When the bunion first appears and is characterized by simple thickening and a sensation to the examining finger as of fluid in a sack (which is just what is present), the bunion may be treated with flying blisters, tincture of iodine or strapping with mercurial ointment. If inflammation exists it should be treated as inflammation is treated elsewhere.

Chilblain or Frost-Bite.—Chilblains may be defined as an inflammation of the skin and underlying tissues due to cold. Anemic persons and those who are weakened from hunger or fatigue are more liable than their more fortunate fellows.

Symptoms.—First, redness accompanied by hypersensitiveness of the parts and tingling. This is soon followed by purplish lividity and diminished sensibility. Blanching with numbness supervenes. Next coagulation takes place and is characterized by the parts becoming hard, white, absolutely insensible. In very severe cases gangrene follows. The parts shrivel up and blacken. An inflammatory line of demarcation shows itself later.

Treatment.—In the stage of redness friction with a towel soaked in ice-water or with ice or snow should be resorted to until the congestion disappears, when the parts should be wrapped in cotton wool. The patient should not be taken into a warm room until after reaction has taken place.

Tonic treatment is indicated in nearly all cases and should consist of cod-liver oil, quinine or some such general tonic.

For the itching the following have been recommended:

Painting with tincture of iodine.

Soap liniment.

Diluted turpentine.

ART AND SCIENCE OF COOKING.

THE QUALIFICATIONS OF A COOK.

What Cooks Should Know.—An old saying runs, "If fools never went to market, bad wares would not be sold." A woman, whether she goes to market herself or not, ought to be a judge of meats, fish and fowl, to know stale from fresh fruits and vegetables, to have clear ideas of good flour, rice, sago, and the scores of things required in the culinary department. She ought to know all about kitchen utensils, the essential ones, and their quality. She should be familiar with the time required to cook different articles, and the full management of the fire.

No Drudgery at Home.—In short, kitchen and house work should be elevated from mere humdrum drudgery. They should be carried on with the exactness of science, and the refinement of art. There is great opportunity in this direction to give our daughters a training in a department of knowledge that may lessen, perhaps, their brilliancy in the parlor, but that will wield in the long run a more enduring and noble influence.

Art of Setting a Table.—To set a table properly, to be able to select and prepare the food to be placed on it, if such preparation is needed on her part, is something of which any woman has a right to be proud, and those who have acquired these arts bring to their husbands treasures more to be prized than much gold.

THE MODEL HOUSEWIFE.

A Model Dining-Room.—A woman of tact will have her dining-room the cheeriest room in the house. In that room she desires to have manufactured good bodies, strong minds and cheerful spirits. She will see to the comeliness of her dishes, the cleanliness of the linen, and the addition of bouquets or other artistic decorations, for well does she know that the road to the palate lies through the eye. There is inducement to tarry at an attractively-set table, and a good housewife can so please her family by cleanliness, by savory cooking, cheer and comfort at the table, as to incline all to proper leisure in eating, and thus to the performance of an important duty toward their bodies.

The Model Kitchen.—Housekeepers should bring the same interest and intelligence to bear in matters pertaining to the kitchen and dining-table as in the other important transactions of life. In all this there is science, but no mystery. It involves patience and understanding, and, when well done, it repays for trouble bestowed. A good cook rises to the dignity of an artist, and may rank with the chemist and with the physician.

UTENSILS REQUIRED FOR SUCCESSFUL KITCHEN-WORK.

For the convenient and successful management of kitchen-work, various implements and utensils are necessary. The following is a useful reference list of these articles, prepared by Helen Campbell:

TINWARE.

One boiler for clothes, holding eight or ten gallons.
Two dish pans, one large, one medium sized.
One two-quart covered tin pail.
One four-quart covered tin pail.
Two thick tin, four-quart saucepans.
Two two-quart saucepans.
Four measures, from one gill to a quart, and broad and low, rather than high.
Three tin scoops of different sizes for flour, sugar, etc.
Two pint and two half-pint moulds for jellies.
Two quart moulds.
One skimmer, with long handle.
One large and one small dipper.
Four bread pans, 10x4x4.
Three jelly-cake tins.
Six pie plates.
Two long biscuit tins.
One coffee pot.
One colander.
One large grater.
One nutmeg grater.
Two wire sieves, one ten inches across, the other four, and with tin sides.
One flour sifter.
One fine jelly strainer.
One frying basket.
One Dover egg beater.
One wire egg beater.
One apple corer.
One pancake turner.
One set of spice boxes, or a spice caster.
One pepper box.
One flour dredger.
One sugar dredger.
One biscuit cutter.
One potato cutter.
A dozen muffin rings.
Small tins for little cakes.
One muffin pan.
One double milk boiler, the inside boiler holding two quarts.
One fish boiler, which can also be used for hams.
One deep bread pan; a dish pan is good, but must be kept for this.
One steamer.
One pudding boiler.
One cake box.
Six teaspoons.

WOODENWARE.

One bread board.
One rolling pin.
One meal board.
One wash board.
One lemon squeezer.
One potato masher.
Two large spoons.
One small spoon.
Nest of wooden boxes for rice, tapioca, etc.
Wooden pails for graham and cornmeal.
Chopping tray.
Water pail.
Scrubbing pail.
Wooden cover for flour barrel.
One board for cutting bread.
One partitioned knife box.

IRONWARE.

One pair of scales.
One two-gallon pot with steamer to fit.
One three-gallon soup pot with close-fitting cover.
One three-gallon porcelain-lined kettle, to be kept only for preserving.
One four or six-quart kettle, for apple sauce, etc.
One tea kettle.
One large and one small frying pan.
Two Russia or sheet-iron dripping pans, one large enough for a large turkey.
Two gem pans with deep cups.
Two long-handled spoons.
Two spoons with shorter handles.
One large meat fork.
One meat saw.
One cleaver.
One griddle.
One wire broiler.
One toaster.
One waffle iron.
One can opener.
Three pairs of common knives and forks.
One small Scotch or frying kettle.
One chopping knife.
One meat knife.
One bread knife.
One set of skewers.
Trussing needles.

EARTHEN AND STONEWARE.

Two large mixing bowls, holding eight or ten quarts each.
One eight-quart lip bowl for cake
Half a dozen quart bowls.
Half a dozen pint bowls.
Three or four deep plates for putting away cold food.
Six baking dishes of different sizes, round or oval.
Two quart blanc-mange moulds.
Two or three pitchers.
Two stone crocks. holding a gallon each.
Two crocks holding two quarts each.
One bean pot for baked beans.
One dozen Mason's jars for holding yeast, and many things used in a store closet.
Stone jugs for vinegar and molasses.
Two or three large covered stone jars for pickles.
One deep jar for bread.
One earthen tea pot.
One dozen pop-over cups.
One dozen custard cups.
Measuring cup.

MISCELLANEOUS.

Scrubbing and blacking brushes.
Soap dish.
Knife board.
Vegetable cutters.
Pastry brush.
Egg basket.
Market basket.
Broom.
Brush.
Dust pan.
Floor and sink cloths.
Whisk broom.
Four roller towels.
Twelve dish towels.
Dishes enough for setting servants' table, heavy stone china being best.
Patent cake beater.
Cherry stoner.
Meat cutter for cutting meat very fine.
Patent wine press.
Patent jelly press.
Patent irons.
Tea strainer.
Bread toaster.
Corn grater.
Ice pick.
Strainer cloth.
Funnel.
Dipper with holes in it.
Fish fork with long handle.
Wooden fork.
Oyster frying pan with inside drainer.

MISCELLANEOUS—Continued.

Sausage cutter.
Cork screw.
Meat pounder.
Coffee mill.
Apple parer.
Can opener.
Cream whipper.
Gravy strainer.
Wire basket.
Corn popper.

HOUSEKEEPER'S TABLE.

Measures.—As many families have no scales for weighing, a table of measures is given which can be used instead. Weighing is always best, but not always convenient. The cup used is the ordinary coffee or kitchen cup, holding half a pint. A set of tin measures, from a gill up to a quart, is very useful in all cooking operations:

One quart of sifted flour is one pound.
One pint of granulated sugar is one pound.
Two cups of butter packed are one pound.
One quart of butter is one pound.
One quart of Indian meal weighs one pound, two ounces.
One quart of powdered white sugar weighs one pound, one ounce.
One quart of the best brown sugar weighs one pound, two ounces.
Ten eggs are one pound.
Five cupfuls of sifted flour are one pound.
A wine-glassful is half a gill.
Eight even tablespoonfuls are a gill.
Four even saltspoonfuls make a teaspoonful.
A saltspoonful is a good measure of salt for all custards, puddings, blanc-manges, etc.
Use one teaspoonful of soda to a quart of flour.
Use two teaspoonfuls of soda to one of cream of tartar.
Use two heaping teaspoonfuls of baking powder to one quart of flour.
Use one cup of sweet or sour milk as wetting for one quart of flour.
Forty drops make one small teaspoonful.

GENERAL RULES FOR THE SELECTION OF FOODS.

Age of Meats has an influence on the quality of meat. The flesh of young animals is more tender than that of old, yet experience shows that the younger is more resistant to the digestive powers. Veal and lamb tax digestion and dyspeptics more than beef and mutton. The tissues of young animals, moreover, are more gelatinous, less stimulating, and of less nutritive value. Beef is in perfection about the seventh year, wether mutton at the fourth, ewe mutton at two years.

Sex of Meats also has an influence on the quality of the meat, the female being more delicate and finely-grained. Castration takes away the strong flavor and improves meat for edible purposes. Meat is better in season. Mutton and beef are never actually out of season, yet when used in the early winter months the animal has had the advantage of abundance of fresh summer food.

How to Kill Animals.—The best method of killing animals is by draining off the blood. There is a loss of nutriment, it is true, in this way, but it renders the meat more pleasant to the eye, easier to keep, and improves the flavor, and there is less danger of obtaining any blood disease the animal may have had.

Mutton or Beef.—Mutton is easier of digestion than beef. This may escape the notice of a well person, for such a one has digestive powers in excess of what is required for easy digestion of either, but in the dyspeptic a nice balance between comfort and distress may exist. With such a one the beef may rest somewhat heavily, while mutton may excite no discomfort. It is well to remember idiosyncrasies may exist, and that to some, mutton may act as a poison.

Pork.—Pork is rich and trying to the stomach, and it is absolutely out of season in the summer time.

Cured Meats.—Cured meats are less digestible than the same meat fresh. Bacon is an exception to this rule. Venison is digestible, but too rich for some stomachs. Bone contains quite an amount of nutritive material. To extract it, the bones must be well crushed and boiled for a long time.

Fish Foods.—The white flesh fish are easier of digestion than the red flesh. Whiting, the chicken of the fish tribe, being the easiest digested of the white flesh: cod the hardest. Oysters are self-digestive when eaten raw. Cooking makes them less so. They make blood rapidly with far less stimulation than meat. They are peculiarly valuable for the aged, the intemperate and those who suffer from exhaustion, as after a severe hemorrhage, or chronic discharges of any kind.

Eggs.—Eggs are easier to digest when eaten slightly boiled, even more so than when used raw.

Soups.—Good soup is a valuable article of diet. It has been said that to administer a well-made plate of soup is as important as to prescribe a pill.

Best Vegetable Foods.—Of the vegetable foods, the farinaceous or starchy are most nutritious. Bread to be digestible must be light. Macaroni and vermicelli, on account of their closeness of grain, are not quite as easy of digestion as bread.

Oatmeal.—Oatmeal is a nutritious food, but does not agree with all persons; sometimes it causes acidity. Many a dyspeptic has been cured by giving up its frequent use. Barley is a strength-giving food not fully appreciated in this country. The Arabs give it the preference as a food for their horses.

Rye.—Rye is nearly as nutritive as wheat, and useful in costive cases. Corn is rich in fat, nourishing, and digestible when the fatty nature is not an objection. Rice is the food of a vast number of the human race; it is very rich in starch, but poor in nitrogen; it possesses an easily-digested starch granule. In cases of diarrhœal affections it agrees better than any other kind of solid food. Arrowroot, sago and tapioca, being pure starch, can be used only as an auxiliary to other foods. Buckwheat contains carbon in excess: it makes better cakes when it is mixed with wheat or rye flour.

Beans and Peas.—Beans and peas are nutritive; they should be cooked well, masticated thoroughly, and eaten with starchy food—not with much meat. Oleaginous seeds, like almonds, walnuts, Brazil nuts, etc., are highly nutritive, but like all articles permeated with fatty matter, are hard of digestion.

Potatoes.—Potatoes, when mealy, are easy of digestion; when close and watery, hard. Young potatoes being more watery, are therefore of more difficult digestion. Plants of the cabbage tribe are hard to digest. They contain much sulphur, thus giving rise to flatulency; they are wholesome and agreeable, however. We must not suppose we are never to use an article simply because it is comparatively hard to digest. Judgment must be used.

Fruits.—Of the fruits, plums are the most likely to cause disorder of the bowels. Raw pears are easier to the stomach than raw apples. Cherries, like plums, easily cause diarrhœa. Serious consequences have followed the swallowing of the stones of cherries. Bananas, on account of the amount of nitrogen they contain, are quite nutritious.

Value of Condiments.—Condiments are not strictly alimentary, but prove of service in more ways than one. First, they render food more tempting, and thereby increase the amount used. Second, they aid digestion. Third, they may correct injurious properties belonging to an article. Vinegar and pepper are used instinctively with those things hard to digest.

Value of Coffee.—Coffee is the cup that cheers, but does not inebriate. An enthusiast exclaimed: "Breakfast without coffee is like a wedding without a bride." Coffee stimulates the brain gently, banishes somnolence, and aids digestion, strengthens one for the day's work, invigorating and cheering him. Used in moderation, and not too strong, no harm can come from its use.

Tea.—Tea should be used with the same moderation as coffee, and then, particularly if the black tea is selected, it cheers and exhilarates without doing any harm. Used in excess it is a fertile source of nervousness and dyspepsia, as well as of constipation.

THE DIGESTIBILITY OF VARIOUS KINDS OF FOOD.

A table of the comparative digestibility of different articles of food is of interest as well as of practical value:

Meats.—Easy to Digest.—Mutton, venison, hare, sweetbread, chicken, turkey, partridge, pheasant, grouse, beef tea, mutton broth, beef.

Hard to Digest.—Pork, veal, goose, liver, heart, brain, lamb, duck, salt meat, sausage.

Fish.—Easy to Digest.—Turbot, haddock, flounder, sole, fresh fish (generally), roasted oysters, trout, pike.

Hard to Digest.—Mackerel, eels, salmon, herring, halibut, salt fish, lobster, crabs, mussels, cod.

Vegetables.—Easy to Digest.—Asparagus, French beans, cauliflower, beets, potatoes, lettuce.

Hard to Digest.—Artichoke, celery, spinach, cabbage.

Fruit, Etc.—Easy to Digest.—Baked apples, oranges, grapes, strawberries, peaches, cocoa, coffee, black tea, sherry, claret.

Hard to Digest.—Apples, currants, raspberries, apricots, pears, plums, cherries, pineapples, chocolate, pickles, porter.

TIME REQUIRED TO DIGEST CERTAIN ARTICLES OF FOOD.

It requires three hours to digest one pound of beef.
It requires three and a half hours to digest one pound of cheese.
It requires two hours to digest one pound of milk.
It requires three hours to digest one pound of eggs.
It requires four hours to digest one pound of veal.
It requires four hours to digest one pound of fowls.
It requires four hours to digest one pound of pork.
It requires one hour to digest one pound of tripe.
It requires three and a half hours to digest one pound of bread.
It requires three and a half hours to digest one pound of potatoes, boiled.
It requires two hours to digest one pound of potatoes, roasted.
It requires four and a half hours to digest one pound of cabbage.
It requires two and a half hours to digest one pound of beans.

FOOD COMBINATIONS.

Selection of Table Foods.—In selecting foods for the table, one must take into consideration the habits of the individuals to be fed, and the ever-varying climatic conditions. The sedentary must be fed differently from laborers, who require a larger proportion of more nutritious foods.

A combination of food that would be delightful in July or August, would be insufficient and distasteful in December. In cold and damp weather, warm food is better relished.

Judgment of the Cook.—The cook should use good judgment, considering the character of the eaters, and ever changing with the weather. She should know that certain kinds of foods are antagonistic to each other, that they will not digest well together, and that, with others, there is a sort of a kindred tie, which makes an agreeable combination. For example, sweet potatoes and tomatoes go well together, the one being sweet and nutritious, the other, acid and juicy.

Rules for Combining Foods.—Dr. Susanna W. Dodds gives the following rules for food combinations.

1. Fruits and vegetables should not, as a rule, be eaten together.

2. Vegetables are best eaten at the noon-day meal, two or three varieties being quite sufficient. Tomatoes do well with vegetables, grains, or meats; but they should not, as a rule, be eaten with fruits.

3. The Irish potato is an exception among vegetables; it seldom quarrels with anything.

4. Fruits and cereals are particularly suited to the morning and evening meals, and very little other food is required.

5. A supper is best made of bread and fruit only, taken in limited quantities, and at an early hour.

6. Fruits, if eaten raw, should be ripe and of good quality, and persons with feeble stomachs digest them better at the beginning of the meal; this is particularly true when warm foods make a part of the repast.

7. Some persons cannot digest certain kinds of raw fruits for supper, or late in the day; let them take these on sitting down to the breakfast table.

8. Meat should be used at the noon-day meal, and in cold weather rather than warm.

9. The grains digest well with all other foods, though some persons cannot eat them in the form of mushes. They should always be well cooked.

10. Persons with feeble digestion should, as a rule, confine themselves to a single kind of fruit at a meal; they can make the changes from one meal to another.

11. Those who find it difficult to digest vegetables, should not attempt more than one kind at a given meal, until the digestion is improved. Often it is best to leave them off entirely for a time.

12. In selecting vegetables for a single meal, do not, if there are

several varieties, have *all* of them of the watery kinds, as cabbage, asparagus, white turnips, etc.; nor all of the dryer sorts, as baked beans, winter squashes, sweet potatoes, etc., but blend the more and less nutritive kinds in a judicious manner.

13. If you have for dinner a thin vegetable soup, follow with something more substantial, as baked beans, baked potatoes, or corn bread; but if you have bean or split-pea soup, let the other vegetables be of a kind less hearty.

14. On very cold days, have a warm dinner of good nutritious articles; select mainly solid foods with grains, rather than thin soups and watery vegetables.

15. On a warm day make the breakfast largely of fruits, with a moderate supply of cereals; the dinner of young vegetables, or fruits, a dish of grains, and a little bread. Eat lightly, and you will not suffer so much from the heat.

16. In very cold weather take the chill off your stewed fruit, fruit pies, or other dishes, before serving them. Pastries, if used, are best at the mid-day meal, and so are puddings.

17. Never have too great a variety at a single meal, have few dishes, well prepared, and make the changes from one meal to another.

18. If one meal falls below the average as to quality or variety, see that the next is fully up to the mark.

THE EFFECTS OF COOKING UPON FOOD.

What Good Cooking Does.—What purposes are fulfilled, it may be asked, by cooking? Our food is rendered more pleasing to the eye, agreeable to the palate and digestible by the stomach. Cooking lessens cohesion, coagulates the albumen of meats, solidifies the fibrine, gelatinizes fibrous and connective tissues; it softens the consistence of vegetables, and so enables them to be more readily masticated, loosens their intercellular structure and thus facilitates the penetration of digestive juices into their substances, and it causes the starch granule to swell and burst, allowing the digestive fluids to come in contact with the central part.

Cooking Imparts Warmth.—Then the warmth imparted to food by the process of cooking aids the digestive action of the stomach, and also exerts a reviving effect upon the system when it is fatigued, or has been exposed to cold. The modes of cooking in common use are: Boiling, roasting, broiling, baking, frying and stewing.

BOILING.

Preparing Meats for Boiling.—If the object to be attained is the extraction of the virtue of meat into the surrounding liquid, as in making broths and soups, the article should be cut up finely and placed in cold water. After soaking for a short time heat should be applied and the temperature slowly raised. Thus treated, the principles of the meat pass out into the surrounding liquid, and as this gains in flavor and nutritive properties the meat becomes impoverished.

Retaining Meat Flavors.—If it is desired to retain the flavor and nutritive properties of the meat an opposite process must be adopted by plunging the meat suddenly into boiling water and briskly maintaining the boiling process for a few moments. This coagulates the albuminous matter upon the surface and forms an almost impermeable external layer which keeps the juices from escaping from the substance of the meat.

When to Stop Boiling.—After this the boiling should not be continued, a temperature of about 165 degrees Fahrenheit being all that is required, and this should be continued until the cooking is done. This will give a juicy and tender central meat, possessing all the properties of nutritiveness and digestibility. The usual fault committed in boiling meat is in keeping up too high a temperature by which the muscular tissue is made to shrink and become hard and indigestible.

Boiling Fish.—Fish is rendered firm in proportion to the hardness of the water in which it is boiled; hence by boiling it in sea-water or salt-water its flesh is firmer and more highly flavored.

How to Boil Potatoes.—Potatoes should be boiled in their skins to retain their soluble constituents. This object is still further attained by adding a little salt to the water. By steaming, the object is still further secured.

Objection to Boiled Food.—One objection to boiled food is that it is more insipid than food cooked in other ways. This loss of flavor makes it less tempting to the palate, but it sits more easily on a delicate stomach.

IN BOILING USE COLD WATER FOR:

1. All kinds of salt meat, salt fish, some fresh fish, and root vegetables, except very young potatoes.
2. Such green vegetables as artichokes, cabbage, beans, peas, asparagus, sea-kale and broccoli.

IN BOILING USE BOILING WATER FOR:

1. Almost all green vegetables. (See exceptions opposite.)
2. Shell-fish, herrings, soles, skate, mackerel and all crimped fish.
3. All kinds of puddings, whether of paste, batter or rice, except plain boiled rice.

Boiling Rules.—1. When meat is boiled enough it looks plump and shrinks away from the bone.

2. When vegetables are done enough they sink to the bottom of the water.

3. When fish is done the eye-balls fall out, and the fins are easy to pull away.

TIME REQUIRED FOR BOILING.

(Much depends upon the freshness and age of the articles.)

For each pound of corned beef	30 minutes
For each pound of beef	15 to 30 minutes
For each pound of veal	15 to 20 minutes
For shoulder of mutton weighing 5 to 6 pounds	1 hour
For leg of mutton, for each pound	20 minutes
For leg of lamb	15 minutes
For tongue of beef	4 hours
For ham, for each pound	½ hour
For turkey, for each pound	20 minutes
For brill	10 to 15 minutes
For turbot (4 to 5 pounds)	20 to 30 minutes
For haddock	15 to 30 minutes
For mackerel	20 to 30 minutes
For salmon, to each pound	8 minutes
For skate	30 to 60 minutes
For whiting	5 to 15 minutes
For cod (only simmer)	1 hour
For fish in general, to each pound	10 minutes
For carrots	1 hour
For turnips, parsnips, cabbage, seakale	1 hour
For cauliflower, onions, beans (young)	1 hour
For peas (young), squash (spring)	½ hour
For dried peas	2 hours
For winter squash (steam)	2 hours
For oyster-plant	1 hour
For beets (young)	1 to 2 hours
For beets (old)	3 to 8 hours
For asparagus (young)	½ hour
For asparagus (old)	1 hour
For artichokes	1 hour
For winter carrots, parsnips, turnips and cabbage	2 hours
For corn	10 to 15 minutes

ROASTING.

How to Roast.—Roasting is conducted upon the same general principles as boiling. First the sharp heat and then the pan must be removed to a greater distance from the fire to allow a lower heat gradually to penetrate the centre. Roasted meat is more savory than boiled. If properly roasted the meat should be juicy enough to show a quantity of red gravy with the first cut.

When Roasts are Done.—Before serving the meat it should be ascertained whether it is done or not, and this can be done by drawing it back from the fire and pressing the fleshiest part with the finger. If the cooking be perfect the flesh will yield to the finger; if not, there will be a little resistance. For fowls and game examine the leg; if the flesh yield and is ready to come away from the bone the cooking is sufficient. When meat is nearly done there are small jets of steam to be seen coming from the meat at the side next the fire.

TIME REQUIRED FOR ROASTING.

For beef (rare), to each pound	10 minutes
For beef (well-done), to each pound	15 to 20 minutes
For mutton, to each pound	15 minutes
For veal, to each pound	20 minutes
For turkey, to each pound	10 to 12 minutes
For duck (game)	½ hour
For duck (tame)	1 hour
For capon	50 to 60 minutes
For fowl	60 minutes
For pigeon	15 to 30 minutes
For pheasant	35 minutes
For partridge, woodcock or plovers	15 minutes
For grouse, snipe, small birds	20 minutes
For larks	6 minutes
For hare	1½ hours
For rabbits	20 to 60 minutes
For goose	2 hours

BROILING.

Advantage of Broiling.—Some one has said "the gridiron is the thermometer of civilization." Broiling produces the same effect as roasting, but the proportion of scorched material is greater on account of the relatively larger amount of surface exposed. The principle of cooking should be the same to retain the central portion juicy. If a cook cannot manage to broil meat well, if her broiling make a greasy, yet burned morsel, she had better fry, for this process is less likely to be a failure; but broiling is better for weak digestions.

A Good Broiling Fire.—For good broiling the fire should be prepared at least a quarter of an hour before it is required; a layer of cinders, an inch and a half thick, spread over the hot coals and left to burn clear. If not perfectly clear at the last moment a little salt thrown on the fire makes it burn more clearly and frees it from smoke.

The Proper Gridiron.—The gridiron should be clean, and its upper surface well greased to prevent the meat from sticking. An improved kind of gridiron has its upper surface grooved and all terminating in a hollow in the handle, so as to save a little of that rich gravy which would otherwise fall into the fire.

TIME REQUIRED FOR BROILING.

For rump steak, about 1½ pounds	10 to 15 minutes
For fillet steak, 1½ pounds	7 minutes
For mutton chop, 5 ounces	6 minutes
For sheep's kidney (brisk fire)	4 minutes
For veal chop, 7 ounces	9 minutes
For pork chop, 7 ounces	9 minutes
For mackerel	10 to 15 minutes

BAKING.

Effect of Baking.—Baking renders meat more impregnated with empyreumatic, or smoky tasted products, and therefore richer and stronger for the stomach than any other process of cooking.

TIME REQUIRED FOR BAKING.

For potatoes (with or without skins)	1 hour
For egg-plant and tomatoes	1 hour
For omelet	15 to 20 minutes
For eggs (until they set)	15 to 20 minutes
For shad	1 hour
For cod, black fish and haddock, 4 pounds	1 hour
For fish generally, 4 to 6 pounds	1 hour
For clams	20 minutes

FRYING.

Effect of Frying.—Frying is also an objectionable process of cooking for persons of weak digestive powers. The article of food becomes more or less penetrated with fatty matter, making it more resistant to the digestive fluids. It is also likely to contain fatty-acid products arising from the decomposition of the fat used in frying; these are not well borne by the stomach, causing general dyspeptic symptoms, but particularly heart-burn.

Removing Objections to Frying.—Frying is less objectionable if the meat or fish is rolled in cracker-dust and egg and then dropped into hot lard. The egg hardens instantly and no fat penetrates the inside.

STEWING.

Effects of Stewing.—Stewing places food in a highly favorable state for digestion. The articles to be cooked are just covered with water, and should be exposed to a heat sufficient only to allow of gentle simmering; much of the nutritive matter passes into the surrounding liquids; this is eaten as well as the solid material. If properly cooked the meat should be rendered sufficiently tender to break down under moderate pressure. If boiling is permitted the meat becomes tough.

RECIPES FOR HYGIENIC COOKING.

VARIOUS DIET DRINKS.

Toast Water.—Toast water, the simplest of all drinks, is also one of the most grateful. It is made by toasting thoroughly on both sides a half slice of bread, a day or two old, and pouring over it a quart of cold water, then putting it into a hot place and letting it steep for half an hour or so. A small piece of lemon peel may be added, which will improve its flavor.

Apple Water.—Take two apples, peel them; take out the core, and slice up thinly. Take a small piece of the yellow rind of lemon, enough to give a flavor, and put this with the sliced apples and a little sugar into a jug; pour a pint of boiling water over them, and when cold strain ready for use; roasted tart apples may be used in place of fresh ones.

The commencement of the apple season is the best time for making good apple water.

Wine Whey.—Boil half a pint of milk, and while boiling add a wineglassful of sherry wine. Separate the curd by straining through muslin or a sieve. Sweeten the whey to taste, and grate upon it a little nutmeg. It will be found very palatable and refreshing.

Lime Water and Milk.—Take clear lime water and fresh milk, of each a wineglassful; mix. Let a tablespoonful or less be taken at once. This will generally soothe an irritable stomach.

Lemonade.—To four lemons add a quarter of a pound of loaf sugar and three pints of boiling water; rub some sugar on the rinds of two of the lemons till it is yellow. Strain the juice of the four lemons (do not use the white pith and seeds), put the sugar and juice into a jug, and pour the water over it. Cover it till cold. Oranges can be substituted for the lemons.

Barley Water.—Wash two ounces of pearl barley several times in cold water, which must be thrown away. Then pour on two quarts of boiling water, and boil down to a quart. Flavor with thinly-cut lemon rind and sugar to taste, but do not strain unless at the patient's request; add the juice of a lemon or of a tart orange if the patient can take acids.

Flaxseed Tea.—Wash two ounces of flaxseed by putting them in a small strainer and pouring cold water through it; take the yellow rind of half a lemon, as thin as possible; to the flaxseed and rind add one quart of water; let it simmer for an hour and a half. Strain away the seeds, and to each half pint of tea add a teaspoonful of sugar.

Rhubarb Water for Spring Drink.—Take eight ounces of rhubarb, wipe clean with a cloth; cut up into as thin slices as possible; put into a jug; add three ounces of sugar, the yellow rind of half a lemon, the juice of one lemon, and a quart of boiling water. When cold strain for use.

Hop Tea.—Pour a quart of boiling water upon half an ounce of hops, cover this over and allow the infusion to stand for fifteen minutes; the tea must then be strained off into another jug. A small teacup may be drunk in the morning, which will create an appetite and also strengthen the digestive powers. It is an excellent medicinal drink.

Oat Water.—Into two quarts of cold water stir a single handful of fresh oats; let it stand fifteen to twenty minutes, or longer. Pour off the water as it is wanted and serve.

Bread and Butter Broth.—Spread a slice of well-baked bread with good fresh butter; sprinkle it moderately with salt and black pepper. Pour a pint of boiling water over it, cover and let it stand to cool.

Milk Lemonade.—Dissolve six ounces of loaf sugar in a pint of boiling water, and mix with them a quarter of a pint of lemon juice and the same quantity of sherry, then add three-quarters of a pint of cold milk. Stir the whole well together, and pass it through a strainer until clear.

Camomile Tea.—Put about half an ounce of camomile flowers into a jug, pour a pint of boiling water upon them, cover up the tea, and when it has stood about ten minutes pour it off from the flowers into another jug; sweeten with sugar or honey. A cupful of it in the morning will strengthen the digestive organs. A teacupful in which is stirred a large dessertspoonful of moist sugar and a little grated ginger, is an excellent thing to administer to aged persons a couple of hours before dinner.

Iceland-Moss Tea.—Wash one ounce of iceland-moss in cold water to remove impurities. Then heat with water up to nearly the boiling point, and reject the liquid, which has extracted much of the bitter principle. Next boil with a pint of water for ten minutes in a covered vessel, and strain with gentle pressure while hot. The result is mucilaginous demulcent liquid, with mildly-bitter tonic properties. It may be flavored with sugar, lemon peel, or aromatics; or milk may be used instead of the water, by which a nourishing liquid is obtained.

Irish-Moss Tea.—Macerate half an ounce of moss in cold water for ten minutes. Remove and boil in three pints of water for a quarter of an hour, and then strain. The tea thus made possesses mucilaginous properties, and may be flavored with orange or lemon juices and peel, and also with wine. By doubling the quantity of the moss a mucilage is obtained, and when in a highly concentrated state the product solidifies into a jelly on cooling.

Rice Water, or Mucilage of Rice.—Thoroughly wash one ounce of Carolina rice with cold water. Then macerate for three hours in a quart of water kept at a tepid heat, and afterward boil slowly for an hour, and strain. This is a useful drink in cases of dysentery, diarrhœa, and irritable states of the alimentary canal. It may be sweetened and flavored like barley water.

Cranberry Tea.—Mash ripe cranberries thoroughly, and pour boiling water over them; let the mixture stand a few minutes, or till cold; then strain off the water and sweeten to taste.

Bran Tea.—Boil a large handful of bran in a quart of water for ten minutes, then strain off the water into a jug, sweeten it with one ounce of gum arabic and a good spoonful of honey. Stir all well together. This drink may be used in all cases of affections of the chest, such as colds, catarrhs, consumption, and also in cases of measles.

Rose Tea.—Take half an ounce of red rose buds (the white heels being removed), three tablespoonfuls of white-wine vinegar, and one ounce of sugar or sugar candy. Put them into one quart of boiling water, and let the mixture stand near a fire for two hours; then strain it.

Jelly Water.—Put a dessertspoonful of wild cherry or blackberry jelly into a goblet of ice water. Beat up well. This is an excellent drink in case of fever.

Decoction of Marshmallow.—Add five pints of boiling water to a quarter of a pound of dried marshmallow root. Boil the mixture down to three pints, and strain through a cloth.

Decoction of Camomile.—Take two ounces of camomile flowers and one ounce of fennel seeds; pour over them four pints of boiling water; let them boil, and strain perfectly clear.

Egg Water.—Blend the whites of two eggs with half a pint of cold water by stirring gently (not beating); add half a teaspoonful of sugar, or half a teaspoonful of salt, to make it palatable. This is highly recommended for children with diarrhœa while teething.

Lemon-Peel Water.—Carefully pare off the rind of one lemon, and placing this in a hot jar, pour upon it one pint of boiling water; cover closely until cool; pour off the fluid, and add a tablespoonful of brandy or two tablespoonfuls of sherry wine. A pleasant summer drink.

Milk and Cinnamon Drink.—Boil in one pint of new milk sufficient cinnamon to flavor it pleasantly, and sweeten it with white sugar. This may be taken cold with a teaspoonful of brandy, and is very good in case of diarrhœa. Children may take it milk-warm without brandy.

BROTHS AND GRUELS.

Mutton Broth.—1. Put two pounds of scrag of mutton into a saucepan with three pints of water and a little salt. Let it simmer gently two hours; strain it through a sieve; when cold remove every particle of fat. It can be thickened with arrowroot, barley or ground rice. If the patient can have broth with some of the meat and barley in it, add them; also a little bit of nice brown toast.

Mutton Broth.—2. Take one pound of meat free from bone, and wash it, put it on the fire with a quart of water; when it boils skim it as clear as possible by laying a piece of thin blotting-paper on the top, the greasy particles will adhere to the paper, and so free the preparation from them (to an invalid nothing is more disagreeable than broth served with a quantity of fat floating on the top, and to avoid this it is always better to let it get cold, as the fat can then be easily removed). Then add a little more cold water, which will make the scum rise afresh; take it off the stove and season it with parsley root, a small carrot, an onion, and a blade of mace, if the palate of the invalid be strong enough to bear it; boil it an hour and a half at least, till the meat is tender, then strain it.

Chicken Broth.—1. Remove from a chicken the skin, lungs, liver, etc.; cut the meat from it lengthwise in large strips, then take a sharp knife and cut these strips across the fibres of the meat into thin shavings, removing as much of the fat as possible; put the shavings into a jar; add one saltspoonful of salt and pour over these as much cold water as will just cover them. Mix up the slices of chicken with the water, so as to prevent the meat from forming a solid mass in the jar; cover the jar with paper; have in readiness a saucepan containing as much cold water as will reach to one inch from the top of the jar; when the jar is placed in it, let it simmer gently over a slow fire for an hour and a quarter, the saucepan being lightly covered. The bones of the chicken are meanwhile to be broken up and placed by themselves in a pint of water, to which has been added a pinch of salt, and allowed to simmer gently until the above is ready. Take all the meat of the chicken out of the jar and pound it thoroughly, adding by degrees a little of the liquor from the bones and a little water. Press the meat through the back of a hair sieve into a bowl, crushing it through with the back of a wooden spoon. Take a teacupful of the broth made from the bones, and, having first removed by means of a piece of paper any grease there may be on the surface, pour this with the thick meat broth into a saucepan; add four tablespoonfuls of cream, or of milk, if cream be unobtainable or forbidden, and a little salt and pepper; set the saucepan on the fire and boil up.

Chicken Broth.—2. Skin and chop up small a small chicken, or half a large fowl, and boil it, bones and all, with a blade of mace, a sprig of parsley, and a curst of bread, in a quart of water for an hour, skimming it from time to time. Strain it through a coarse colander.

Veal Broth.—The fleshy part of the knuckle of veal is best. Boil it in a saucepan for two hours, and strain. Pearl barley, rice, vermicelli, or semolino may sometimes be advantageously added.

Barley Broth.—Take two pounds of lean mutton, preferably the neck, and boil it in four quarts of water. It should be put into cold water and heated slowly and skimmed well; then add barley and cook two hours and a half; then add the turnip and parsley and cook an hour longer. Do not cook fast at any time, and stir if there is danger of scorching. Strain and remove all grease. If the patient does not like herbs omit them, also the turnip, and use only the barley and meat. Serve with dry toast or plain corn bread baked with a crust.

Beef Tea.—Take one pound of lean beef. With a sharp knife scrape it into fibres; put the scraped meat into a delicately clean saucepan, and pour half a pint of boiling water on it; cover it closely and set it by the fire for ten minutes, and then, having strained into a teacup, place it in a basin of ice-cold water and remove all fat from the surface. Serve in a warm cup. When greater strength is required use half the above quantity of water, or even less if the patient is able to take a spoonful only at a time.

Beef Juice.—Broil quickly some pieces of round or sirloin steak of a size to fit in the cavity of a lemon squeezer. Both sides of the beef should be quickly scorched to prevent the escape of the juice, but the interior should not be fully cooked. As soon as ready, the pieces should be pressed in the lemon squeezer, previously heated by being dipped in hot water. The juice, as it flows away, should be received into a hot wineglass, and, after being seasoned to the taste with a little salt and a little cayenne pepper, should be eaten while hot.

Oatmeal Gruel.—Pour a pint of boiling water into a saucepan; into this stir a couple of tablespoonfuls of oatmeal until quite smooth; let this boil well for ten or fifteen minutes, season with salt, then strain through a strainer, and add sugar. This is a soothing and nutritive food, holding a totally different position, on account of the nitrogenous matter present, from the farinaceous preparations. Milk may be used instead of water, or a little brandy added.

Arrowroot.—Mix thoroughly two teaspoonfuls of arrowroot with three tablespoonfuls of cold water, and pour on them half a pint of boiling water, stirring well during the time; the arrowroot thickens as it is poured on, and nothing more is necessary. Genuine arrowroot requires no boiling and, if good, it will be quite clear, as clear as good starch; but if muddy or warm water is used it must be put into a saucepan and boiled until it thickens, carefully stirring all the time, before it can be given to an invalid. Sweeten with loaf sugar, and flavor with lemon peel or nutmeg, or add sherry or brandy if required or ordered by the physician. Milk may be employed instead of water, but when this is done no wine must be added, as it would be otherwise curdled. It is not wholesome if insufficiently cooked.

Corn-Flour Gruel.—A good gruel can be made by mixing a dessertspoonful of corn-flour, which has first been blended with cold water, into half a pint of hot water; stir on the fire for ten minutes, sweetening with moist sugar; flavor with nutmeg or a tablespoonful of wine.

Egg Gruel.—Beat up an egg to a froth, add a wineglass of sherry, flavor with a lump of sugar, a strip of lemon peel, and a little grated nutmeg. Have ready some gruel, very smooth and hot, stir in the wine and egg, and serve with sippets toast. Arrowroot may be made the same way.

Farina Gruel.—Stir two tablespoonfuls of farina into a quart of water in a milk saucepan; let this boil until it has grown quite thick; add a pint of milk, a little salt, and let the whole boil fifteen minutes longer; turn out into a bowl, and sweeten to taste.

Rice Gruel (for Diarrhœa).—Take two ounces of ground rice, a quarter of an ounce of cinnamon, and four pints of water; boil for forty minutes, and add a tablespoonful of orange marmalade.

Onion Gruel.—Slice an onion, and boil it in the quantity of water required for the gruel till quite tender; then add oatmeal, mixed smooth in cold water, a little fresh butter, a peppercorn or two, etc.; let it boil a few minutes; then strain it.

SOUPS.

Vegetable Soup.—Select a nice fresh soup bone, have it partly cracked or broken, but not crushed; put the meat into cold water about four hours before dinner and heat slowly; skin as soon as ready; add barley, keep the pot closely covered, and stew slowly for an hour. Prepare the vegetables, which will be four white potatoes sliced, a little cabbage, one carrot sliced fine, two turnips, one leek, and one stalk of celery cut fine; add barley, or instead, rice, noodles, vermicelli or rivels. The potatoes and all but rice and barley should be added last, when used. Corn cut from the ear and green peas can be used to suit the taste.

Barley Soup.—In four quarts of water put two pounds of pieces of meat, a quarter of a pound of pearl barley, four sliced onions, salt and pepper, with a little parsley; let the whole simmer for three hours or more. This makes a very nutritious soup.

Oyster Soup.—Drain the liquor from fifty fresh oysters, and heat it slowly in a porcelain kettle; then heat two quarts of milk in a double boiler until it boils; let the liquor of the oysters boil, and put in the oysters as soon as boiled; add the milk at once and remove from the hot fire. The oysters will be cooked sufficiently. Season with six whole peppers, a little salt and butter. If the oysters are salts, care should be taken that the milk does not curdle.

Soup for Invalids.—Boil two pounds of lean veal and a quarter of a pound of pearl barley in a quart of water very slowly, until it becomes of the consistency of cream. Pass it through a fine sieve and salt it to taste. Flavor it with celery seed, if liked, or use fresh celery, if in season, a very small quantity will suffice. Let it simmer very slowly. This soup is very nourishing.

Sago Soup.—Boil an ounce of sago in a pint of weak beef tea or broth until it be well dissolved.

Mutton Soup.—Select a nice shoulder of mutton; put it on to boil in two quarts of lukewarm water; when the meat is half cooked add the herbs tied up in a coarse cloth; then add one pared turnip and some celery cut into small pieces; one carrot cut fine, one leek. When all is almost done, add two potatoes cut fine, and noodles or rivels, vermicelli or macaroni. Noodles are made nicely by breaking into a cup of flour salted to taste, one egg, and mixing to a paste that can be rolled out very thin, and then placing before the fire until it is dry enough to cut in long strips. When tomatoes are liked, two raw ones, or half a can of canned ones, add very much indeed to the flavor and give it a much richer color.

Bread Soup.—Let the stock simmer over the fire three or four hours; place in a bowl bits of bread, no matter how hard and stale; pour over them enough hot broth to soak them well; mash fine, and put the whole into the stock. Let it continue to simmer a few minutes longer.

Vermicelli Soup.—Take a shin of veal and put it in four quarts of water; adding one onion, or leek, two carrots, two turnips (white), and a —little salt. Boil this three hours; add two cups of vermicelli, and boil it an hour and a half longer. When ready for the table remove the bone. The vegetables also may be taken out and the broth served clear.

Onion Soup with Milk.—Slice some onions into a stewpan, with a piece of butter or lard, and a little flour; when brown add a quart of boiling milk, pepper, salt, and any cold, cooked vegetables at hand; boil up once or twice and you have a delicious food, without meat or stock. Water can be used instead of milk, and sift in a little flour or bread crumbs, and brown well.

Green-Pea Soup.—Take two quarts of shelled peas; boil the pods in two quarts of water until the volume is reduced to one quart. When cool put in the peas and boil them; when half done add two quarts of new milk, let this boil, being careful it does not scorch, and then serve. Season with butter, pepper and a little salt. This soup is a favorite at fashionable dinners.

Mock-Turtle Soup.—Parboil a calf's head, divided, and cut up all the meat into small pieces; then break the bones and boil them in some beet broth; fry some shalots in butter, add flour to thicken, and stir them in; skim carefully while boiling; add a pint of white wine; let the whole simmer till the meat is perfectly tender; then put in some chives, parsley, basil, salt, cayenne, soy and mushroom catsup to your taste and boil for ten minutes; squeeze a little lemon juice into the tureen and pour the soup on it. Serve with four meat balls.

Sheep's-Head Soup.—Cut a sheep's liver and lights into pieces and stew them in four quarts of water with some onions, carrots and turnips, half a pound of pearl barley, pepper, salt, cloves and a little marjoram, parsley and thyme. Stew all these until nearly done; then put in the sheep's head and boil until quite tender; then it should be taken out and everything strained from the liquor. Let this stand until cool; take off the fat and thicken it with butter and flour. A glass of wine may be put into the tureen if desired before pouring in the soup.

Tapioca Soup.—Put two and a half ounces of tapioca into one quart of cold stock and bring it gradually to the boiling point. Let it simmer gently till tender, and serve.

Macaroni Soup.—Take one ounce and a half of macaroni, a small piece of butter and a pinch of salt. Put them into boiling water and let them simmer half an hour. When tender drain and cut into thin rings or lengths and drop into the boiling soup stock. Stew gently fifteen minutes.

Split-Pea Soup.—Boil one pint of peas in three quarts of water till they become broken to bits; add any vegetable that is liked one hour before the soup is to be served. The best peas require three and a half hours to cook them. One tablespoonful of olive oil will improve the soup.

Snapper Soup.—Make, according to the quantity of snapper, a good stock from knuckles of veal and shins of beef. Kill and bleed the snappers and remove their entrails. Take out the meat and eggs (if any), break the shells into pieces and put in the stock to boil. Then put in the snapper meat, and, when cooked, take it out, cut it into small pieces and set aside until wanted. Now add to the stock tomatoes, onions in slices and all kinds of sweet herbs. Boil well and strain off the stock, thicken with brown flour and season well with salt and pepper. Add the juice of two lemons and lastly the snapper meat. If there are no eggs in the snapper add chicken eggs, a little flour and milk or water. Boil separately and add them to the soup just before dishing it up. When all is done flavor with brandy or Madeira wine.

Clam Soup.—Wash twenty-five good-sized clams thoroughly, and when perfectly clean boil them in their shells with very little water. The water should be boiling when the clams are put in. In a few minutes the clam shells will open and the juice run out. Remove them from the shells and chop them up as fine as possible and press them through a coarse sieve, adding a finely-chopped onion, some minced celery and a little mace and pepper. Then strain the liquor in which they were boiled, stir into it all the ingredients and boil it fifteen minutes, adding a little milk and thickening with flour and butter. Then remove from the fire and stir in the well-beaten yolks of two eggs. Serve the soup in a tureen lined with toast.

Chicken Soup.—Take a chicken weighing about three pounds. Cut it into quarters and place in a porcelain pot. Add two quarts of water and let it boil one hour. Then have a fryingpan ready with a lump of butter and remove the chicken to it and have some boiled rice ready, cooked in another saucepan—about one cupful of boiled rice—as boiling the rice with the chicken improves the flavor of the soup. Add about one tablespoonful of chopped parsley, one onion and a small carrot in very thin slices; boil the giblets separately, and when the chicken is a rich brown remove it to make a gravy by adding a half cup of water, one tablespoonful of flour and the giblets chopped fine. Serve the gravy separately.

Mulligatawny Soup.—This Indian dish is admired by many. The meat may be either veal, rabbit or fowl. Get a knuckle of veal; have the bones cracked in two or three pieces; put it into a stewpan, cover it with water, and, when it is rather more than half done, cut off as much meat as you wish for the soup and boil the bones and the remainder of the meat well down to make stock soup; let this stand until cold and then remove the fat;

cut the meat into small pieces and fry them in butter with four onions sliced and floured, two dessertspoonfuls of curry powder, a little cayenne pepper and salt; put these into the stewpan; add the stock gravy with three or four cloves and a good tablespoonful of lemon juice; let the whole simmer for an hour and serve up with some plain boiled rice in a separate dish.

Economical Veal Soup.—Boil a piece of veal suitable for a fricassee, pie or hash. When tender, take the meat up and slip out the bones; put these back into the kettle and boil two hours; then strain the liquor and stand away until the next day. When wanted take off the fat; put the soup into a clean pot; add pepper, salt, an onion, a half teacupful of rice, a tablespoonful of flour mixed in cold water and slices of potatoes; boil thirty minutes and serve hot.

Okra Soup.—To five quarts of water and a shin of beef add four dozen okras, sliced thin, and a few tomatoes; boil from six to seven hours and add salt and pepper to taste.

Beef Soup.—Prepare the extract; add a tumbler of boiled milk, slightly thickened with flour (see that there are no lumps in it); flavor with extract of celery.

EGGS AND MILK FOODS.

Boiled Eggs.—1. Put the eggs into boiling water, and boil three minutes for soft-boiled; five minutes for hard-boiling, and fifteen for hard-boiled for an invalid. Eggs boiled fifteen minutes, or considerably longer if convenient, are easily digestible by the most delicate stomach. Sometimes physicians direct that the patient have eggs which have been boiled two hours.

As an alternative, the following is subjoined:

Boiled Eggs.—2. Cover the eggs with boiling water, and put them in a place on the range where the water will keep boiling hot, but not boil; let them stand seven minutes; when they will be found deliciously jellied and perfectly digestible.

Poached Eggs.—Fill a fryingpan half full of boiling water, and add a little salt; break the eggs separately into a cup, and pour them carefully into the water whilst boiling, watching each so as to shape the whites, or place muffin rings in the water and pour the eggs into them. Have enough water to cover them. Remove carefully so as not to break them. They can be served on buttered toast or alone. Two and a half minutes is sufficient time to cook them.

Eggnog.—Beat the yolk of one egg, sweetened with one tablespoonful of sugar to a cream; add half a cup of milk and a tablespoonful of whiskey; beat the white to a stiff froth, and stir it into the other very lightly. Omit the milk when more nourishment is desired.

Egg and Sherry.—Beat up an egg till it froths; add a lump of sugar and two tablespoonfuls of water; mix well, pour into it a wineglassful of sherry, and serve before it gets flat.

Mulled Egg.—Toast a piece of bread nice and brown; beat up an egg very lightly in a bowl, then boil one and a half cups of milk, sweeten, and while hot pour on the egg, and add the toast cut into small pieces. This is a delightful food for an invalid.

Sherry, or Brandy and Milk.—To one tablespoonful of brandy, or one wineglassful of sherry, in a bowl, add sugar and a very little nutmeg for flavor, warm a cupful of new milk, and pour it into a spouted jug; pour the contents from a height over the wine, sugar, etc. The milk must not boil.

Mulled Wine.—Boil some spices, cloves, nutmeg, cinnamon, or mace, in a little water; then add a wineglass of sherry, or any kind of wine, and some sugar; bring it to the boiling point, and serve with toast. If claret is used, it will require a good deal of sugar.

Egg and Brandy.—Beat up three eggs to a froth, add four ounces of water, two or three lumps of sugar, and pour in four ounces of brandy, stirring all the time.

Milk Toast.—Toast one or two thin slices of bread. Boil a cup of sweet milk and season with a little salt and butter; lay the toast in a hot, deep plate and pour the milk over it.

Milk Porridge.—Stir into one quart of boiling milk two tablespoonfuls of flour mixed with a little cold milk and half a teaspoonful of salt. Boil half an hour; strain before serving. A handful of raisins and a little grated nutmeg may be boiled with it.

Rice Milk.—Wash three tablespoonfuls of rice, put it in a saucepan with some milk, and let it simmer gently till the rice is tender, stirring it now and then to prevent its burning. Sweeten a little and serve with a cut lemon, black-currant jam or stewed apples.

Arrowroot, Lime-Water and Milk.—Take equal parts of milk, arrowroot water and lime water, and sweeten to taste. The most delicate stomach can digest this food, and at the same time is very nourishing.

Milk Lemonade.—Dissolve six ounces of loaf sugar in a pint of boiling water, and stir in a quarter of a pint of lemon juice and the same quantity of sherry; then add three-quarters of a pint of cold milk.

Indian-Meal Milk Gruel.—Sweeten one quart of milk and stir into it two tablespoonfuls of cornmeal; this must be cooked carefully and stirred whilst cooking, as it may scorch; flavor with nutmeg; more meal must be used if it is not as thick as desired.

Flour and Milk.—Tie some flour up tightly in a cloth, boil it slowly in water for ten or twelve hours. The flour becomes agglomerated into a hard mass, and is only wetted on the surface; after drying mix one grated tablespoonful with a pint of milk and boil. This is a nourishing and useful remedy for dysentery and diarrhœa, and one which should be more generally known.

Arrowroot Blanc-Mange.—Mix two tablespoonfuls of arrowroot, three-quarters of a pint of milk, and lemon and sugar to suit the taste; omit the lemon if the patient cannot have acids.

Thickened Milk.—Mix a tablespoonful of flour smooth with a little milk; pour upon it a quart of boiling milk, and when it is thoroughly amalgamated boil up the whole once, stirring all the time to keep it smooth and free from lumps; serve with dry toast. It becomes specific by scorching the flour first before you mix it. This is excellent food in cases of diarrhœa.

Scrambled Eggs.—Beat up a dozen eggs and turn them into a pan in which a little butter has been allowed to melt, season with a little pepper and salt, and toss about rapidly to prevent sticking.

Egg Omelet.—Beat up four eggs until they are light; add them to one pint of milk, with a little pepper and salt, and a teacupful of flour; beat well all the lumps. Have ready a frying-pan with equal parts of lard and melted butter in it; and stir into this the batter with a fork until it thickens; bake to a light brown, and serve while hot.

Savory Eggs.—Break five eggs into a dish, add a pinch of salt and some pepper, and a little chopped thyme; beat them well together; rub a small pan twice with an onion, place in it two ounces of fresh butter, and boil the whole; when boiling pour in the eggs; stir quickly until cooked about ten minutes, then turn on to a hot dish, and serve immediately.

Scalloped Eggs.—Boil five or six eggs hard, chop them up roughly, make a white sauce, and mix all up well together; butter a pan, and put in it a layer of bread crumbs, and then a layer of egg, and so on until full; finish with bread crumbs on top; bake to a light brown.

FRUITS AND JELLIES.

Roasted Apples.—Take tart apples; wipe each clean and put in the oven to roast. As soon as they are soft to the core take them out and cool them. Serve with sugar and cream if desired.

Baked Apples.—Select smooth, fair apples; remove the blossom end and core; place in an earthen or tin pie plate; if tart, crowd them; if sweet, keep them separate; pour a cupful of cold water into the plate and set the plate, covered, in an oven to bake. Do not let the apples get dry, as it will burn up the juice; add a little sugar to the juice, or put some sugar into the core holes and cover each with a little slice of lemon, first lightly squeezing the juice over the apples. Sweet apples are preferred for baking. Serve with cream.

Steamed Apples.—Prepare as for baking, and steam two or three hours, or until soft. Serve as above.

Stewed Apples.—Select apples not too ripe; pare, core and slice them into thin pieces; wash hastily, or place them in cold water while cutting, so as to remove the rust which a steel knife always imparts; put them into a porcelain kettle and add cold water to make them moderately juicy; cook till soft; stew quickly if tart, slowly if sweet, and do not stir, and the pieces will hold together unbroken, swimming in the clear juice. When tart, sweeten while hot and leave to cool.

Apple Jelly.—Cut the apples, cores, skins and all into thin slices, and put them into water enough to cover them; boil until soft; then strain through a strain-cloth and add three-quarters of a pound of sugar to one pint of juice; boil until it jellies, and then pour into moulds.

Baked Peaches.—Take good clingstone peaches, wash them well, and do not pare them; fill a stone jar nearly full; add a pint or more of cold water; cover, and bake in a very slow oven about two hours. If the peaches are tart, less cooking and less water is required. Sweeten to taste.

Stewed Dried Peaches.—Pared peaches are best, as the skin is disagreeable to most persons, let them soak in warm water on the back of the stove until quite tender, then finish over a quick fire; sweeten to taste.

Grape Jelly.—Press the juice from the grapes, and to each pound (a pint is a pound) of juice add one pound of sugar. Currants, plums (gages), quinces, blackberries, strawberries, and all fruits may be used in the same manner. Quinces have to be boiled before being pressed.

Orange Jelly.—In one quart of water boil two ounces of isinglass until it becomes a strong jelly; add the juice of four oranges and a little sugar. Lemons can be used instead of oranges.

Cider Jelly.—Boil new cider to the consistency of syrup, adding one pound of white sugar to a gallon of cider; skim it and let it cool. It will be a beautiful clear jelly, very nice to make a drink.

Wine Jelly.—To one pint of wine add one ounce of isinglass, half a pound of sugar, and spices to taste.

Calf's-Foot Jelly.—Place four calf's feet into four quarts of boiling water and boil until reduced to one quart; then strain, and when cold, take off the top. In taking out the jelly avoid the settlings. To a quart add six ounces of loaf sugar, the crushed shells and the whites of five eggs very well beaten, half an ounce of clarified isinglass, the juice of two lemons and a glass of sherry wine; after the mixture has stood a few minutes, put the pan over a gentle fire, and stir until the liquid boils and rises in the pan, but do not stir it after this stage is reached; let it boil twenty minutes, removing the scum carefully as it rises; now remove from the stove to one side and let it settle for twenty minutes; then pour the jelly through a jelly bag made of flannel, first wringing the bag out in hot water. Do not put the jelly into metal moulds to remain for any length of time as the action of the metal will be apt to affect the color. Keep it in a cool place; in summer surround it with ice.

Beef Jelly.—Take one pound of round steak, free from fat, cut into small pieces and put into a wide-mouthed bottle (or what is better, an earthen jar); barely cover the meat with cold water, set the jar in a kettle of water and let it boil one hour; add to the juice thus obtained two wine glasses of best sherry wine, the juice of one lemon and a quarter of a box of gelatine or enough to set the jelly; pour into very small cups or moulds and turn out upon a saucer when ready to serve. A very delightful and nutricious jelly.

Rice Jelly.—Take a quarter of a pound of rice flour, and half a pound of loaf sugar, and boil them in a quart of water; when they become a glutinous mass, strain off the jelly, add wine or lemon juice and let it stand until it is entirely cold before serving.

Strawberry Ice.—Press one and a half pounds of strawberries through a hair sieve; they will make a little over a pint of pulp; add one pint of syrup of ordinary consistency; also a gill of red currant juice or the juice of half a lemon, and a pint of water; mix the ingredients and work the composition in the freezer; use when sufficiently frozen.

Mutton Jelly.—Put six mutton shanks, half a pound of lean beef and a little pepper and salt, in three pints of water, and let them simmer gently for five hours; strain, and when cold take off the fat. Warm up as much as is wanted at a time, and keep the rest in a cool place.

Chicken Jelly.—Pound together the bones and meat of half a raw chicken and cover them with cold water; heat slowly in a covered vessel and let it stand until the meat is in white rags, and the liquid reduced to one-half; strain through a fine sieve, add salt and cook a few minutes longer. Wine or other seasonings may be added, according to special tastes.

Arrowroot Wine Jelly.—Take one cupful of boiling water, two teaspoonfuls of white sugar, and one dessertspoonful of brandy, or three of wine; wet the arrowroot in a little cold water and rub smooth, then stir into the hot water with the sugar melted in it; boil it, and stir until clear, and add the wine and brandy; pour into moulds. Lemon or orange may be used instead of wine.

Iceland-Moss Jelly.—Soak one handful of iceland-moss in cold water; then stir in one quart of boiling water, and let it simmer until dissolved; add the juice of two lemons, one glass of wine, and a little cinnamon; sweeten to taste and strain into moulds. Irish moss can be used the same way.

Stewed Prunes.—Wash the fruit and allow half a pound of sugar to each pound of fruit; put on the stove and cook slowly for two hours. They are very nice for a sick person, when a little warm.

Cranberry Jelly.—This is made like currant jelly. When the juice is expelled, strain, and to every pint of juice add a pound of sugar; boil until it thickens, and skim it. Serve with roast turkey.

Farina Jelly.—Boil three pints of milk, and whilst boiling sprinkle in slowly one-quarter of a pound or four tablespoonfuls of farina; continue to boil for about three-quarters of an hour; when done turn into a mould and place on ice. It makes a beautiful ornament for the table.

Orange Water-Ice.—Rub the best part of four oranges upon a half dozen lumps of sugar, being careful in this not to rub the under skin; put the flavored lumps into a little warm syrup and let them remain until dissolved; now take a dozen fine Florida oranges and two lemons, and strain the juice, adding a pint of water and one quart of clarified sugar to the flavored syrup; mix and freeze. Pineapples, cherries, lemons or any other fruit may be used in the same way. In using lemons always add oranges. Coffee-ice is made by dissolving a pound of sugar in one quart of water, and adding half a pint of strong coffee and the white of one egg.

Apple Butter.—Boil ten gallons of sweet cider in a brass kettle until reduced to five gallons; take a bushel of apples, wash, drain and put them into the boiled cider, and when soft stir constantly until finished with a wooden spoon; two hours will be required to cook slowly, if for winter use. Before taking it from the fire add cinnamon and cloves to taste; remove from fire, and while hot pour the butter into a well-glazed crock or stone jar, and set away to cool.

Peach Butter.—Pare and slice fine the peaches and proceed as in apple butter, only adding water instead of cider; quince and other fruits may be substituted. Marmalade can be made by adding three-quarters of a pound of sugar to each pound of pulp.

MEATS AND GAME.

Roast Beef.—The sirloin and rib pieces are the best for roasting; have the butcher bone and roll the meat, basting it together with the skewers, but avoid many skewers, as they allow the gravy to escape. Place the meat in a dripping pan with a little water and put into a hot oven for ten or fifteen minutes until a crust is formed to imprison its juices; then lower the temperature, and keep at a steady, moderate heat; season with salt and pepper on both sides; cook until done as desired. For gravy, pour off the fat from the drippings into a little water and thicken with flour browned, or let the gravy cook a few minutes. Do not baste roast beef.

Roast Mutton.—A nice shoulder or chime is generally used for roasting. It is best to wash mutton in cold or lukewarm water and dry it with a clean cloth. Place it in a dripping-pan in a hot oven with a little water; after searing the surface, top and bottom, cook moderately in a steady heat; it requires a little basting; roast fifteen minutes for each pound of the meat. A shoulder is nice boned and filled with bread filling seasoned with thyme, salt and pepper. This gives a delicious flavor to the meat. If gravy is needed make it in the same way as beef gravy.

Roast Lamb.—The fore and hind quarters are used for roasting; proceed as in roasting mutton.

Roast Veal.—Take out the bone of a fillet of veal, and prepare a filling of bread, thyme, pepper and salt, and fill with it the cavity (onion can be used also in the dressing); then roast the meat in a moderately hot oven, as veal takes long and slow cooking; when cooked to a nice light brown, remove. It should be basted while cooking. If gravy is desired make it in the same way as beef gravy. Veal is so very dry that a moist dressing is almost essential. The shoulder, loin, knuckle, and breast may be roasted the same way.

Roast Pork.—Bone a leg as in mutton, filled if preferred, only substituting sage or sweet marjoram for the thyme; onion may also be used if the flavor is liked. Make gravy as for beef. The spare-ribs, leg and loin are all delicious when roasted and cut cold. A young pig three or four weeks old can be roasted whole. It should be roasted slowly, and requires long cooking.

Pork Cutlets.—Cut the meat half an inch thick. In broiling sprinkle a little pepper on them, and when almost done add a little salt. When frying, flour them well and season with salt, pepper and sage: fry over a slow fire, and let it cook until brown.

Ham Omelet.—Beat up four eggs very light; add enough fine chopped ham to flavor it; fry in hot butter till brown on the lower side; sprinkle salt and pepper over it, and fold over one-half.

Boiled Ham.—Put the ham into warm water, and boil it for five or six hours; if very salt the water may be changed once, but the temperature of the fresh water should be the same as of that already used; when done take off the skin. Before serving stick cloves at intervals with a ring of black pepper, and garnish with parsley. Boiled ham is best eaten cold. It can be made delicious by sprinkling sugar over it and baking an hour.

Potted Ham.—Cut the remains of cold boiled ham in small pieces, and pound it little by little in a mortar, softening it during the process with melted butter; add cayenne pepper to taste; put it in a jar, pressing it down very smooth; cover it with a little melted butter, and close up tight and set away. It will keep well and as long as desired.

Veal Cutlets.—Take the cutlets—those from the leg are best—and cut them into pieces as nearly of a size as possible; dip them into well-beaten egg, and then into cracker dust, and fry slowly to a golden brown. If the veal is tough parboil it for ten or fifteen minutes; dry before frying.

Veal Omelet.—Chop up very fine three pounds of veal, and with it mix six powdered crackers, a tablespoonful of salt, one of thyme, one of sage, half a tablespoonful of pepper, and half a teacupful of milk; mix and form a loaf; baste with milk and butter while baking, and bake two hours.

Veal Patties.—Chop up the veal and some ham, using only one-third ham to two-thirds veal; add powdered crackers and wet with gravy or milk; use hot milk, two tablespoonfuls of butter, and one beaten egg; season well and bake in patty pans; if eaten hot (and most persons prefer them hot), line the pans with puff paste and send them to the table.

Sweetbreads.—Parboil the sweetbreads, cut them into slices and dip them in eggs well beaten, then into cracker dust or bread crumbs; season with pepper, salt, chopped parsley, and the grated yellow rind of a lemon. They are served with melted butter or mushroom ketchup. They may be garnished with bacon fried in thin slices.

Tripe.—Boil the tripe tender, wipe it dry and dip it in a batter made of eggs, flour and milk, seasoned with salt; garnish with fried parsley. It may be boiled and cut into small pieces and covered with a jelly made by boiling a few cloves in vinegar.

Kidneys.—Skin and parboil some sheep's kidneys, cut them in slices, and fry them in butter for a few minutes, with pepper and salt to taste; mix a tablespoonful of flour with a piece of butter in a saucepan, stir till it begins to color, then add a teacupful of good gravy, and the same quantity of sherry; let this boil five minutes, then add to the kidneys, with a small quantity of parsley, finely minced; make them very hot (but do not let them boil) and serve.

Broiled Cold Meat.—Cut the cold meat into slices and place them on the gridiron, properly cleansed, and rubbed over with a little butter; put into a hot dish a piece of butter the size of a walnut, and a teaspoonful of ketchup; melt together, and lay the meat from the gridiron on the gravy made by these ingredients as soon as it is done.

Broiled Mutton Chops.—Remove most of the fat from the chops and place them over a clear fire, turning often until done; have a dish hot on the stove and in it put a little hot water, pepper and salt; as the chops are taken from the fire butter each while hot and dip it back and forth in the water; this will season them well and form a delicious gravy. Serve as hot as possible and have the plates heated before serving to prevent any chill.

Fried Mutton Chops.—Trim the chops and season them with salt and pepper; fry them in their own fat or pork fat, turning them frequently; brown a little butter and flour, adding some water, and pour this gravy over the chops. Be careful not to let the chops burn while frying.

Boiled Leg of Mutton.—Cut off the shank and trim the knuckle; boil three hours; when part cooked add a little salt. Serve with sauce, and preferably cut cold; save the water for stock, boiling up the shank well cracked, and the knuckle; mashed turnips are usually served with it.

Beef Croquettes.—Chop up fine some cold roast beef and season it with pepper and salt; mix some bread crumbs with milk or with mashed potatoes, and with a little flour on the hands make up the meat and the crumbs into balls; fry in a pan with hot lard or dip it into egg and then into fine pulverized cracker dust. The croquette should be dropped into hot lard so as to float.

Beef a la Mode.—Lard a round of beef with slices of fat bacon dipped in vinegar; roll it up with chopped seasoning of cloves, sage, parsley, thyme, pepper and green onions; bind close and put it in a kettle; cook slowly for ten or twelve hours, turning when half done; thicken with a heaping tablespoonful of flour added when the fluid is reduced one-half.

Irish Stew.—Either beef or mutton may be used; cut it into pieces about an inch square and cover with cold water; allow to two pounds of meat two onions, eight good-sized potatoes, two teaspoonfuls of salt and a half teaspoonful of pepper; cover and cook for two hours, skimming as it boils up; thicken the gravy with flour stirred smooth. Serve very hot.

Broiled Beefsteak.—Select a nice sirloin, porterhouse or tenderloin steak; remove from it all suet and place it over the fire, not too hot; it requires a glowing fire without flame or smoke; subdue the flames by sprinkling salt upon the coals; heat the gridiron and rub it with a piece of suet to prevent the meat's sticking; cook as desired and serve very hot in a gravy made of a good-sized piece of butter, some pepper and salt and a gill of water mixed well together while hot. Another sauce may be made by placing in a saucepan an ounce of butter, a teaspoonful of very finely chopped onion, a pinch of sweet marjoram, if desired, and a teaspoonful of fluid beef, together with a wineglassful of sherry or Madeira; boil this a few minutes, stirring constantly, and pour it over the meat in a hot dish. Serve at once.

Dried Beef.—Slice up the dried beef fine and stew it in a little water until tender; beat up an egg with a little flour; put a lump of butter to the beef, stir in the egg and flour and serve on toasted bread with a gravy over it. Milk may be used instead of water.

Pounded Beef.—Take one pound of cold roast beef and pound it well to a paste; add a saltspoonful of salt, half a spoonful of pepper, a blade of mace and half a pound of clarified butter; mix together and pass through a wire sieve; press down in pots, covering the top with butter. In this way beef may be kept until required.

Beef Omelet.—Take three pounds of beef chopped fine, three eggs beaten together, six crackers rolled fine, one tablespoonful of salt, one teaspoonful of pepper and one tablespoonful of melted butter; mix all these ingredients up well and make like a loaf of bread; put a little water and bits of butter into the pan; invert another pan over it; baste the omelet occasionally; bake an hour and a quarter and when cold slice very thin.

Potted Beef.—Cook a beefsteak, cut off the fat, gristle and outside pieces; pound to a paste in a mortar; to one pound of beef add a saltspoonful of white pepper, a little cayenne and grated nutmeg, a little fresh-made mustard, a tablespoonful of beef gravy and three ounces of dissolved butter; press it into pots and pour melted butter over it; serve cold.

Roast Chicken.—Draw and wash a chicken and dry with a towel; rub the inside with dry salt; fill with bread filling seasoned with thyme, salt and pepper, sew up with strong string, crossing the legs and tying down the wings; roast in a moderate oven, having some water in the pan to baste it with; frequent basting makes it a handsome brown. Make a gravy of the gizzard, heart and liver chopped fine, boiled and thickened with flour. Serve with cranberry sauce and onions boiled in milk. Any fowl may be roasted in this way.

Fried Chicken.—After neatly dressing and carving in pieces of proper size, parboil a half hour or longer until tender; take out with fork and place in a fryingpan of melted butter; fry brown by frequent turning to keep from burning. A nice gravy is made by pouring the broth in which it was boiled into the fryingpan with a thickening of flour and any seasoning preferred. Curled parsley arranged as a garnish adds to the general effect.

Stewed Turkey.—An old turkey is more tender stewed than when cooked in any other way. Put into a large pot half a pound of bacon cut in slices, a quarter of a pound of knuckle of veal, three sprigs of parsley, two of thyme, six small onions, one carrot cut in small pieces, three cloves, salt and pepper and then the turkey; add a pint each of broth and white wine; cover as closely as possible and simmer gently about two and a half hours; then turn the turkey over and put it back on the fire for another two and a half hours; dish the turkey; strain the sauce; put it back on the fire and after reducing it to a glaze spread it over the turkey and serve. Some prefer stewed turkey when cold.

Roast Duck.—After cleaning the duck stuff with poultry dressing and roast; if game, half an hour; if tame, one hour; making gravy the same; serve with currant jelly. Goose is roasted the same way, only taking two hours to roast. Skin off the fat, as it gives a strong taste.

Birds.—Small birds are washed and dried and then broiled or roasted and served with sauce or wine gravy or on toast. Reed birds are delicious for the sick.

Quail and Partridges on Toast.—Leave the feet and head on, cross the feet over the breast, and twist the neck round the wing so as to bring the head to the side of the breast, or truss the birds the same as fowls; baste with butter, and when nearly done sprinkle flour over them, and continue basting until they are browned; toast some bread and place it on a plate; pour over it the contents of the dripping-pan, and serve the birds on it. The sauce may be either plain melted butter or beef gravy. Pheasants, grouse, woodcock and snipe may be cooked in the same manner.

Chicken Croquettes.—Chop cooked chicken fine; season with a little pepper, salt and butter, mixed with one egg and a little cream; roll the croquettes on a bread board sprinkled with cracker dust until they are shaped like little cylinders; beat an egg light and dip them into it; then roll them again in the cracker dust; fry in a croquette basket in boiling fat until of a light brown color. The stock of chicken, veal, lamb or mutton may be used instead of cream to mix them with. Croquettes can be made of any fowl in this way.

FISH AND SHELLFISH.

Baked Shad.—Scale, wash and clean the shad, making an incision only large enough to properly clean it; wash it several times so as to be sure that it is clean; fill it with a stuffing composed of equal parts of mashed potatoes and buttered stale bread cut into fine pieces; season with salt and pepper to taste; add parsley or any herb in powder; sew it up with strong thread, lay it in a baking-pan with a few little pieces of butter on top, and dredge with flour; add a little water; bake moderately for two hours, basting quite often. Serve hot.

Broiled or Fried Shad.—Clean and split the shad down the backbone; have the broiler well rubbed with suet, and broil the fish to a golden brown; salt it when done and spread it with butter; serve hot. It is better if corned a little while before cooking, or sprinkle a little salt on and keep it cool over night; wash off the salt in the morning before broiling. To fry shad, clean and cut the backbone out, making three pieces; then season with salt and pepper, and dredge with a little flour, and fry in olive oil or any other fat; drain and send to the table hot, the roe and milts may be fried also, and by many persons are preferred to the fish itself.

Planked Shad.—Scale and split the shad down the back; remove the roe and entrails, wash and dry with a towel; have a heated plank of hickory about two inches thick, and nail the shad on this, with its back to the plank; cook one side while placing it before a hot fire of live coals, at an angle of forty-five degrees, bake it a rich brown color, basting by means of a soft brush, with a thin mixture of melted butter and flour; when done serve upon the plank (send the plank to the table). In the meantime parboil the roe, roll it in cracker dust and egg, and fry so as to serve it with the fish. A bottle of Rhine wine will be found to fraternize well with this dish.

Rock Fish.—Scale, clean and wash the fish; cut off the fins, boil in salted water, let it drain for a minute or two, and place on a hot dish; serve with a rich egg sauce poured over it; garnish with slices of lemon and parsley. Fresh mackerel and sea bass or any other large fish of a similar nature may be cooked the same way.

Halibut.—This fish requires careful cleaning and rubbing with salt to remove the slime which exudes from it; make an incision in the back to prevent the skin bursting on the breast, as the fish swells in boiling; lay it in the kettle, breast upward; add to the water a handful or salt and a cupful of vinegar. Dish with breast upward, and serve with any sauce preferred.

Haddock.—Let it lay a few hours in salt, then boil briskly for about twenty-five minutes, or less, if the fish is small; the head is esteemed a delicacy. Another excellent way to prepare haddock is to cut it into pieces, and salt, pepper and dip it into egg and cracker dust; fry slowly and serve while hot. Fresh cod may be done the same way.

Salmon.—Salmon should be fresh, and if there is more than is required for one meal it can be slightly salted and kept in a cool place for several days. Wash, clean and scald it; boil in plenty of salt water. It can be cooked whole but is best boiled in slices. Remove instantly when done, and let it drain across the fish-kettle; serve with any sauce or with plain melted butter. Trout are dressed whole and served in the same manner. Fish, being naturally soft, require a boiling heat to make them firm.

Mackerel, Boiled, Fresh and Salted.—Clean the fish and boil five minutes; serve with parsley sauce. The fresh fish fried in a little lard is delicious. When salt mackerel are used they may be boiled or fried, after being well soaked, or they may be boiled before soaking.

Salt Codfish.—Soak a piece of fish over night; pour out the water and cover the fish again with lukewarm water; let it stand until cold; then put it in lukewarm water, and let it simmer (but not boil) for two hours; remove the skin and bone; serve with drawn butter or egg sauce, and with whole boiled potatoes. Fresh codfish are cooked like haddock or other fish.

Codfish Cakes.—Take equal quantites of fish and potatoes, shred the fish, and after boiling the potatoes mash them as for table use very smooth; beat them together with a fork and make them into little balls, and float in hot lard until fried a light brown; place before the fire to drain.

Chowder.—Take three pounds of any sort of fresh fish (though fresh cod is best); six large potatoes, two onions and a half pound of salt pork; fry the pork in thin slices to a light brown; add the onions and brown them; pour the fat into a saucepan and put a layer of potatoes, a little onion and pork and a layer of fish cut in small pieces, salting and peppering each layer; just cover with boiling water and boil for half an hour. In the meanwhile boil a pint of milk, and when at the boiling-point break into it a dozen crackers and add a heaping tablespoonful of butter; put the chowder in a pan and pour the crackers and milk over it, or lay the crackers in the chowder dry and pour the boiling milk over all; serve in a tureen; three or four tomatoes are sometimes added. Clam chowder is made the same way with the substitution of one hundred clams for the fish, and the addition of a can of tomatoes.

Stewed Oysters.—Separate the liquor from the oysters, strain it and put it on the stove and let it simmer gently; when hot add some cream, and then, when that is hot, add the oysters; remove at once and pour into a hot dish with a little butter, salt and pepper and serve at once; this can be poured on toast, and many persons prefer it that way.

Oyster Patties.—Beard the oysters, and, if large, half them; put them into a saucepan with a piece of butter rolled in flour; some finely shredded lemon rind, a little pepper and milk, and a portion of the liquor from the oysters; stir all together and let it simmer for a few minutes and then put it into patty pans which should be ready with a puff paste crust in them. Serve hot or cold.

Fried Oysters.—Drain the liquor from the oysters and then roll each in cracker dust; beat up some fresh eggs, add some liquor of the oyster and dip them in it, then roll them in cracker dust, again in egg and again in cracker dust; have some olive oil boiling hot and float the oysters in it, and fry them to a light brown. Lard or olive butter can be used. Garnish with parsley.

Oyster Fritters.—Drain the juice from one hundred oysters, take six eggs beaten up light, two cupfuls of cracker dust and one of flour, a little salt and pepper, all added to the juice, or milk enough to make a batter; then add two teaspoonfuls of baking powder and oysters; have the lard boiling hot; drop the mixture into it by large tablespoonfuls and fry to a nice brown. Clams make delicious fritters and are used in this way very frequently.

Panned Oysters.—Select large, highly-flavored oysters, those for frying are the best; have a small pan about one inch deep with a handle; put into the pan one dozen oysters and their own juice only; place them on a quick fire and when they begin to swell they are done; add a little butter and pepper, also salt (if they are not salts); turn out into a very hot dish, or they may be eaten from the pan in which they have been cooked, while they are steaming hot.

Fried Eels.—Select nice eels weighing two pounds each or less; skin them and place them either in the oven or on a gridiron for eight minutes, to draw out the fat; split them down the thin part, take out the backbone, cut off the fins, scrape the outside and cut them into pieces three inches long; have three ounces of dried crumbs of bread and two well-beaten eggs; dip each piece of eel into the egg and then into the crumbs, and fry in boiling lard over a slow fire till they are a pale yellow color; serve with melted butter or other sauce in a tureen.

Baked Clams.—Put on the liquor from twenty-five clams, and when hot skim it and add a teaspoonful of butter after rubbing a half teaspoonful of flour in it to a cream; stir until it melts, and allow it to become of the consistency of gruel; then, having chopped the clams fine and rejected the tough part, pour them in and let them cook a few minutes only; season with pepper and salt and place in nicely-washed shells, sprinkle with bread crumbs and bake in a quick oven for twenty minutes. Baked clams are a fashionable dish in New England.

Scalloped Oysters.—Take fifty oysters blanched and bearded; strain and boil down the juice as thick as possible and add one quart of cream; rub eight ounces of butter and four tablespoonfuls of flour to a smooth paste with three tablespoonfuls of scalding cream, and add the juice; then season with a teaspoonful of salt, and two teaspoonfuls of allspice, two of white pepper, and two of mace; pour in the yolks of four well-beaten eggs and a little cold water, until smooth; then strain the mixture upon the oysters and mix lightly; butter some porcelain scallop-pans, and sprinkle them with bread crumbs, and heap on each one as many oysters with their sauce as it will hold; sprinkle with bread crumbs or cracker dust and set in a moderately hot oven to brown. Serve very hot as soon as done.

Steamed Oysters.—Scrub the unopened oyster shells till clean; put in a large pot a wire strainer which shall stand about one-third of the depth of the pot from the bottom; place the oysters in it the round side down; pour in water to one-fourth the depth of the pot; put on the lid and set over a quick fire, and boil until the oysters open their shells; take out the oysters and serve them the same as roasted oysters, which they to some degree resemble.

BREAD AND CAKE.

Bread.—1. The general rule for making bread is one quart of wetting—either milk or warm water—to five quarts of flour, and one large cup of yeast; make a sponge of the wetting and yeast with part of the flour; it should be mixed in the evening and will be ready for moulding into loaves the next morning; set it to rise in a warm place in the winter, and in a cool place in the summer; mould the sponge into loaves by adding the remaining flour, and knead with the palm of the hand as much as possible; the dough quickly becomes a flat cake; fold it over and keep on kneeding not less than twenty minutes or half an hour; make into four loaves, and put them into pans; set them in a warm place to rise, when they have become nearly double in size, place them in the oven to bake; the heat of the oven should be sufficient to brown a teaspoonful of flour in one minute, the flour being spread on a small plate so that it may have an even heat; loaves of this size will bake in from forty to sixty minutes; then take them from the pans, wrap them in thick cloths kept for the purpose, and stand them tilted up against the pans till cold. Never lay hot bread on a pine table, as it will sweat and absorb the taste; it should be tilted that the air may pass around it freely.

Bread.—2. Take one quart of flour, a little sugar, and a pinch of salt, two teaspoonfuls of some kind of baking powder, and one and a half pints of milk; mix smoothly and rapidly, and turn into a greased pan; bake in a moderate oven forty-five minutes. The sugar can be omitted and water used in place of milk.

Brown Bread.—Sift into a deep bowl one cup of Indian meal and two cups of rye flour, a teaspoonful of salt and one of soda, vary the proportions of rye and cornmeal according to taste; if more rye is used the dough should be stiff; if cornmeal be the greater part it must be softer and requires longer baking; to one pint of hot water add one cup of molasses and stir until well mixed; make a hole in the middle of the meal and stir in the molasses and water, beating all till smooth; butter a tin pudding boiler, or a tin pan holding three pints, and put in the mixture; set the boiler into a kettle of boiling water; boil steadily for four hours, keeping the water always at the same level; then take out the boiler and set it in the oven for fifteen minutes to dry and form a crust; turn out and serve hot.

Corn Bread.—To a pint of fine Indian meal add shortening about the size of an egg, one teaspoonful of salt, two small teaspoonfuls of cream of tartar, and then milk sufficient to make a batter, and one egg beaten up; dissolve a small teaspoonful of soda and stir it in thoroughly; grease the pan well, and bake in a pretty hot oven about one hour. If you use buttermilk, make the same way, but leave out the cream of tartar.

Graham Bread.—Make one quart of wheat sponge; pour it into a deep bowl and add a teacupful of brown sugar or molasses, half a teaspoonful of soda dissolved in a little hot water, and a little salt; then sift into it one even quart of Graham flour; the mixture should be very stiff; bake in two loaves, for an hour or in a little more. Graham bread requires a longer time to bake than wheat bread. If no sponge is at hand make as follows: Take one pint of milk or water (warm), half a cup of sugar or molasses, half a cup of yeast, a little salt, one cup of wheat flour and two cups of Graham; when all are mixed set in a cool place over night (Graham bread sours more easily than wheat bread); in the morning stir it well; put it into two deep well-greased pans; let it rise an hour in a warm place and bake one hour.

Rye Bread.—This is made by the same rule as for Graham bread, substituting rye for Graham flour, but use enough rye to make a dough which can be turned out, use wheat flour for the moulding pan and hands, as rye is very sticky, and knead only long enough to get it into good shape; raise and bake as in the above rule for Graham bread.

Rusks.—Take three pints of flour and rub a quarter of a pound of butter well through it; then add one pint of sugar, a tablespoonful of yeast, and one pint of warm milk; set it as a sponge, and put in all the ingredients and mix them up together while soft.

Plain Rolls.—Allow one pint of bread dough for twelve small rolls, flour the moulding board lightly and knead into the dough butter or lard the size of an egg; cut the dough into round cakes, which may be flattened out, and one-half turned over the other; spread a little butter between the folds to make what are called pocket-book rolls. This same dough is made into French rolls by pressing a knife handle almost through the centre of round balls of it; put the rolls in a well-greased pan an inch apart and set them to rise an hour and a half before baking; they require more time to rise than large loaves. Bake in a quick oven twenty minutes.

Soda and Cream of Tartar Biscuit.—Mix into one quart of flour one teaspoonful of salt, one of soda and two of cream of tartar, then pass it through a fine sieve; rub a piece of butter or lard the size of an egg in the flour with the hands till perfectly fine; then add one cup of milk; mix well and roll out quickly; cut into round cakes and bake in a quick oven. They are very light if properly made, but all depends upon the mixing and baking, which should be as rapid as possible.

Muffins.—1. Mix one quart of milk, one egg, one spoonful of butter, two spoonfuls of lard, one-half cup of yeast, and flour enough to make a batter a little thicker than griddle cakes; put to rise over night; bake in the morning in rings.

The following is a simple recipe for the same:

Muffins.—2. Mix one pint of new milk, four eggs, a little salt, flour enough for batter; bake in muffin rings.

Waffles.—Take one pint of new milk and add three well-beaten eggs; melt a piece of butter the size of an egg and pour it in; mix with one pint of flour a little salt and two teaspoonfuls of baking powder, and add slowly to the milk and eggs, making a thin batter; beat well and bake at once in a well-greased waffle iron. If sour milk is used substitute soda for the powder. Sour cream makes delicious waffles. Boiled rice added to the above batter makes rice waffles.

Breakfast Puffs or Pop-Overs.—Stir together one pint of flour and one pint of milk; beat one egg very light and add it with a little salt; have a set of gem-pans well greased and heating in the oven; put in the batter and bake half an hour in a hot oven. This is a simple but most delicate breakfast cake. No baking powder or soda must be used.

Hoe Cake.—Take one quart of cornmeal one cup of boiling water, one teaspoonful of salt and one tablespoonful of lard; melt the lard in the water; add the salt and pour the water on the meal until it becomes a dough; when cool make it into one large or two small cakes and bake a half hour to a light brown. It should be baked before an open fire on a board.

Buckwheat Cakes.—Take equal quantities of buckwheat, Indian meal and Graham flour to make one quart; add half a cup of new yeast, a little salt and enough milk or lukewarm water to make a thick batter; set it in a warm place to rise and have a well-greased griddle hot and bake in small cakes. The griddle should be greased each time.

Common Pancakes.—To one and a half pints of milk add a little salt and the yolks of six eggs well beaten; then mix in slowly about six ounces of flour and some melted butter; then add the whites beaten to a froth; the batter should be of the consistency of thick cream; place a fryingpan on the fire and when quite hot put into it a little lard or butter; pour in batter (about one-quarter of a teacupful), and spread it around the pan until thin; then fry brown and turn it over and brown again; they may be served in rolls after being spread with preserves; serve immediately, for if allowed to stand they grow heavy.

Bread Griddle Cakes.—Take pieces of stale bread, soak them in water until soft, drain them and rub the bread to a pulp; then add two or three beaten eggs and milk enough to make a thick batter; cook them on a hot griddle in small cakes. The egg may be omitted.

Flannel Cakes.—**1.** Take a pint bowl two-thirds full of Indian meal and mix with scalding water; stir in a piece of lard or butter the size of two walnuts; then put in cold water so as not to scald the flour; then mix in a pint of flour and, if needed, water enough to make it of the consistency of batter cakes; add two spoonfuls of yeast and set it to rise. Bake on a griddle.

Many cooks make flannel cakes as follows:

Flannel Cakes.—2. Put two ounces of butter into a pint of hot milk, then add a pint of cold milk, four beaten eggs, a teaspoonful of salt, two tablespoonfuls of yeast and enough flour to make a stiff batter; let it rise and fry on a griddle.

Indian Griddle Cakes.—Take one pint of Indian meal, one cup of flour, a tablespoonful of molasses, a teaspoonful of saleratus, a little salt and ginger and sufficient sour milk to make a stiff batter; bake on the griddle. This is the recipe given by Jennie June.

Rye Griddle Cakes.—Mix one quart of sweet milk, two eggs, one-half teaspoonful of saleratus, a little salt, and enough rye flour to make a batter; baking powder may be used instead of saleratus.

Rice Griddle Cakes.—Take one cup of rice boiled very soft and mashed fine, a pint of milk, and two or three eggs, a little flour stirred in and a teaspoonful of baking powder; have ready a hot griddle and bake in small cakes, allowing them to brown nicely, but not to burn.

Pound Cakes.—Take one pound of sugar, one pound of butter; beat well together until very light; add ten well-beaten eggs; beat well again; add one pound of flour; mix until smooth, and bake in moderate heat; flavor with rose. A hot oven is required if baked in small tins.

Lady Cake.—Make the same as gold cake, but using the whites of the eggs only instead of the yolks.

Jelly Cake.—Beat to a cream one pound of butter; add one pound of sugar; then add the yolks of ten eggs and three-quarters of a pound of flour, and finally add the whites of the eggs, beaten to a froth. Bake in shallow tins, and put jelly between each two layers. Use any flavor.

Cream Cake.—Mix four cups of flour, three cups of sugar, one cup of butter, one cup of sweet cream, five eggs, four teaspoonfuls of baking powder. Bake in a quick oven.

Cup Cake.—Take two cups of sugar, three-quarters of a cup of butter, three cups of flour, one cup of milk, three eggs, one teaspoonful of soda, and two teaspoonfuls of cream of tartar; bake in a well-greased pan, taking care to keep the oven at a moderate even heat.

Molasses Cake.—1. Mix three cups of flour, one cup of sugar, one cup of molasses, one cup of butter, one cup of sweet milk, a teaspoonful of soda, three eggs and a little cinnamon and ginger.

Molasses Cake.—2. Take one cup of molasses, one cup of hot water with a teaspoonful of soda in it, a tablespoonful of butter or lard, a teaspoonful of ginger and two cups of flour; if lard is used, add a little salt; put the flour in a dish, make a hole and pour the molasses into it; then mix the butter melted into the molasses, and then the ginger; stir all together, and add the hot water with the soda in it, stir quickly and place at once in a moderate oven.

Molasses Cake.—3. Take two cups of molasses, half a cup of butter, one cup of water and a teaspoonful of soda dissolved in hot water; beat the molasses and butter together, put the soda in this, then the water, a teaspoonful of cinnamon and ginger, and flour enough to make a soft dough; warm the butter or lard, so that it will readily mix with the molasses.

Ginger Cakes.—Take two cups of molasses, shortening the size of an egg, one teaspoonful of soda, two tablespoonfuls of ginger and one cup of hot water; add enough flour to make it stiff.

Ice Cream Cake.—Mix two cups of sugar, three cups of flour, one cup of milk, a tablespoonful of butter, the whites of three eggs and two teaspoonfuls of baking powder; divide and bake in two cakes. For icing, which adds very much to the attractive appearance, flavor the whites of two eggs with vanilla, and beat them up, adding gradually pulverized sugar until stiff.

Coffee Cake.—Mix five cups of flour, one cup of made coffee, one cup of sugar, half a cup of molasses, one cup of butter, and a teaspoonful of cloves; add raisins or currants, if they are agreeable to the taste, and four teaspoonfuls of baking powder.

Dutch Cake.—Take three pounds of flour, one pound of sugar, half a pound of butter, half a pound of lard, half a pound of raisins, one pound of currants, a quarter of a pound of citron, three eggs, one teaspoonful of cinnamon, one grated nutmeg, one quart of milk and two cups of yeast; set a sponge of part of the flour with the other ingredients; and then add the remainder of the flour. This is a wholesome cake suitable for evening use.

Fruit Cake.—Mix three cups of sugar, six cups of flour, one cup of milk, two cups of butter, seven eggs, three teaspoonfuls of baking powder, one of salt, one pound of raisins, half a pound of citron, half a pound of currants, half a pound of figs, three teaspoonfuls of cinnamon, half a nutmeg. This will make three cakes; bake one and a half hours.

Crullers.—Mix one cup of butter, two cups of sugar, one cup of milk, one teaspoonful of soda, three eggs, and flour sufficient to roll out with ease; fry them floating in lard; flavor with nutmeg.

Cocoanut Cake.—Mix one quart of flour, one pound of sugar, three eggs, one pint of milk, a piece of butter the size of two eggs, two tablespoonfuls of baking powder, a little salt and one small cocoanut grated; flavor to suit the taste; bake in a moderate oven.

Snow-Flake Cake.—Mix one cup of butter, two cups of sugar, one cup of cornstarch, two cups of flour, the whites of seven eggs, a scant cup of cream and two teaspoonfuls of baking powder; beat butter and sugar together; add the cornstarch and cream, and then the rest; beat the whites of the eggs to a froth, and then add them to the mixture after everything else; flavor with a few drops of bitter almond, or flavoring may be omitted entirely.

Sponge Cake.—Take six eggs, one and a half cups of sugar, one cup of flour, and one teaspoonful of baking powder; flavor with almond; beat the whites separately; add the yolks and sugar, and the juice of one lemon or a tablespoonful of vinegar; then add the yeast and flour, and finally the whites of the eggs; stir as little as possible.

Marble Cake.—*For the White Portion:* Use the whites of seven eggs, two cups of white sugar, one cup of butter, three cups of flour and half a cup of sweet milk; flavor with lemon or vanilla, and three teaspoonfuls of baking powder; cream the butter and sugar first; then add the white of the eggs, well beaten with the flour and yeast powder.

For the Dark Portion: Mix the yolks of seven eggs with one cup of butter, one of molasses, two cups of brown sugar, two teaspoonfuls of cinnamon, one cup of milk, and five cups of flour; put each part in turn in a cake pan; bake it in a moderate oven; allspice, nutmeg and cloves can be used if desired. The quantities given will make two large cakes.

Chocolate Cake.—Mix two cups of sugar, one cup of butter, one cup of milk, the yolks of five eggs and the whites of two eggs; mix two teaspoonfuls of yeast powder with three and a half cups of flour while dry; cream the sugar and butter, and add the rest; bake in jelly tins; prepare a mixture of the whites of three eggs, one and a half cups of pulverized sugar, three tablespoonfuls of grated chocolate, one teaspoonful of vanilla, all these ingredients being thoroughly mixed together; spread this between each two layers of the cake, and on top of the whole.

Doughnuts.—Mix one pint of milk, one teacup of melted lard, two teacups of brown sugar, one cup of yeast, three eggs, two teaspoonfuls of cinnamon and one of salt; set a sponge and let it rise; then mix in flour enough to make a dough and set it to rise again; then knead and roll out; cut into cakes and fry in hot lard by letting them float in it.

Icing.—To ice a large cake, put eight ounces of powdered sugar into a deep dish with four spoonfuls of rice water and the whites of two eggs, beating and straining it; then whisk it well and it is ready to be put in the cake; set it in the oven a few minutes to harden.

Chocolate Icing.—Take a cup of milk, and a quarter of a pound of grated chololate, one cup of powdered sugar, scald the milk and chocolate, and add the sugar, and pour this on the whites of two eggs after they are well beaten, and proceed as for ordinary icing.

SAUCES AND SALADS.

Lobster Salad.—Boil the lobster about half an hour; when it is cold take it from the shell, being careful to take out the vein in the back; to two heads of salad allow six pounds of lobster, one cup of melted butter, two tablespoonfuls of mustard mixed with a little vinegar and salt and pepper to taste; chop them up together and spread on a flat dish; then beat six eggs and mix with half a pint of vinegar; put this on the stove to thicken, stir it constantly, and when it has become cold spread it over the lobster dressing; the sauce may be served separately.

Mayonnaise Sauce.—Take one yolk of a raw egg, some salt, pepper and a little raw mustard; mix these together with a silver fork in a large plate; add salad oil slowly, and in the quantity used be guided by the taste; mix by stirring one way until quite thick and smooth; then add vinegar enough to thin it a little; if there is any difficulty in getting the oil to mix, add a few drops of vinegar from time to time and keep stirring.

Caper Sauce.—Pound a tablespoonful of fresh-boiled shrimps and a tablespoonful of capers; knead together three ounces of butter and a tablespoonful of baked flour, and stir them into the third of a pint of boiling water; add the pounded capers and shrimps, and a dessertspoonful of whole capers; boil for ten minutes, and serve.

Rice Sauce.—Soak a quarter of a pound of rice in a pint of milk, with a little pepper, an onion, and a little salt; when it is quite tender, remove the spice, rub it through a sieve into a stewpan, and boil it; if too thick add a small quantity of cream or milk. This is good for game.

Egg Sauce.—Mince two or three hard-boiled eggs, and mix them thoroughly together in white sauce.

Celery Sauce.—Cut some celery into inch lengths; fry it in butter until it begins to be tender; add a teaspoonful of flour, which may be allowed to brown, and half a pint of good broth or beef gravy; season with cayenne or black pepper, or other seasoning, as desired.

Drawn Butter.—Rub two teaspoonfuls of flour into a quarter of a pound of butter; add five tablespoonfuls of cold water, or the water any vegetable, such as asparagus, has been cooked in; let it simmer until smooth. If for fish, chopped boiled eggs and capers may be put in. If for boiled fowl, oysters may be put in while it is melting, and cooked through while it is simmering.

Parsley Sauce.—Wash a bunch of parsley in salted water, dip it twice into boiling water, and chop the leaves quite fine; knead a quarter of a pound of butter with a tablespoonful of baked flour, and stir it into the third of a pint of the water that a fowl has been cooked in; let it simmer five minutes; stir in a dessertspoonful of the chopped parsley; serve with fowl or fish. If with boiled fish, use in making the sauce the water the fish was boiled in.

Mint Sauce.—Look over and strip off the leaves of mint, and cut them as fine as possible with a sharp knife; use only the tender tips; to a cupful of chopped mint allow an equal quantity of sugar and half a cup of good vinegar. It should stand an hour before using.

Salad Dressing.—Boil three fresh eggs for ten minutes; when cold rub the yolks to a paste with a little pepper and salt, and teaspoonful of mustard, and a little sugar; mix in the beaten yolk of one egg; add by degrees four tablespoonfuls of salad (Lucca) oil, and, drop by drop, two teaspoonfuls of tarragon vinegar, and one and a half tablespoonfuls of vinegar; serve at once.

Chicken Salad.—Take two chickens, weighing six pounds, two bunches of celery; boil the chickens in very little water; cut into large pieces; dry the celery without washing; take two yolks of hard-boiled eggs, the yolk of one raw egg, and mix them together with one teaspoonful of dry mustard; add slowly half a bottle of oil, the juice of one lemon, two tablespoonfuls of vinegar, a teaspoonful of salt and a little red pepper; put in a cold place just before using; mix it through the chicken; also two hard-boiled eggs cut fine, one tablespoonful of capers, and six olives cut fine; save a little dressing for the top.

Potato Salad.—Slice some fresh-boiled potatoes or some cold potatoes; dress them with oil, vinegar, salt and pepper, precisely like any other salad, adding a little onion and parsley chopped fine. Use cream or melted butter if oil is not liked.

Tomato Salad.—Take ripe tomatoes and cut them into thin slices; sprinkle over them a small quantity of finely-chopped green onions; add salt, pepper, vinegar, and oil, if liked. The oil should be in the proportion of three tablespoonfuls to one of vinegar.

Anchovy Sauce.—Wash four anchovies in hot water, scrape them, and take out the bones; pound the fish to a smooth paste; mix with it a quarter of a grain of cayenne, the strained juice of half a lemon, and the third of a pint of cold water; put it into a saucepan, boil up, and strain; knead together four ounces of butter and a tablespoonful of baked flour, and stir it into the sauce; boil for ten minutes; add one tablespoonful of good cream, and serve at once.

Apple Sauce.—Pare, core and slice very thin half a dozen juicy apples, and the rind of a lemon, and cook them till tender; beat the apples to a smooth pulp and remove the lemon peel; add a little butter, sugar and a little grated nutmeg.

Winter Salad.—Mix equal proportions of celery, boiled beet-root, raw white cabbage, and cold fowl or rabbit, all chopped fine, together; dress with mayonnaise sauce, and serve with a garnish of lettuce leaves. This is a delightful salad for persons with weak digestive organs. For very delicate persons omit the cabbage, as it is not very easily digested.

Water-Cress Salad.—Wash the cress and drain it well; chop a green onion, two radishes, one spoonful of grated horseradish and a few leaves of lettuce; season with a little salt and pepper, and plenty of oil and vinegar. This makes a crisp, delightful salad for table use.

VEGETABLES.

Mashed Potatoes.—Boil the potatoes, after peeling them and taking out the spots; let them lie a while in cold water; then put them on the stove in a saucepan with lukewarm water; when dry and mealy drain off the water and mash them fine with a potato-masher; add a small bit of butter, a little milk, and salt to taste; then beat to a foam with a fork; heap lightly in a dish, and serve at once. They should be cooked quickly. Never brown them in the oven.

Baked Potatoes.—Wash the potatoes carefully and bake in the skin; it will require an hour to bake large ones. They should be eaten with salt the moment they are done. They may be peeled and baked under meat of any kind; they are delicious this way. They should be basted once or twice with the drippings. Sweet potatoes may be roasted the same way.

Potato Croquettes.—Mash some fresh boiled potatoes, and add a little mace or nutmeg, cayenne pepper, and one beaten egg; make into little balls or rolls, and roll in egg and crumbs or cracker dust; fry in boiling lard; drain on brown paper, or before the fire.

Potato Chips.—Wash and peel the potatoes, and cut them into thin shavings; have ready boiling fat, and drop them into it; when done to a light brown drain them over or before the fire, and sprinkle fine salt over them; keep them crisp and serve hot.

Scalloped Potatoes.—Slice half a dish of cold boiled potatoes very thin; add half a pint of milk to them and four ounces of butter; cut into pieces, fill up the dish with bread crumbs or cracker dust, and about an ounce more of butter; add a little pepper and salt, and bake until brown.

Potato Cakes.—Take some mashed potatoes and mix a little flour with them; then make them into little patties and fry them over a hot fire until they are brown.

Potatoes a la Creme.—Put two ounces of butter into a saucepan with a dessertspoonful of flour, and some parsley and scallions, both chopped fine; salt and pepper to taste; mix together and add a little cream, and set on the fire, stirring constantly until it boils; cut the cold boiled potatoes into slices and put them into the saucepan with the mixture; boil again, and serve very hot.

Fried Raw Potatoes.—Peel and slice the potatoes into very thin slices; put them into cold water for a little while; dry with a towel, and put them into a frying pan with a little butter or lard, salt and pepper; cover down, and every little while turn them; when they are tender and a nice rich brown they are done. The grease should be drained from them when sent to the table.

Lyonnaise Potatoes.—Slice six cold boiled potatoes, chop up very fine an onion and a little parsley, enough to fill a teaspoon; put a tablespoonful of butter into a frying-pan, and fry the onion to a light brown; then add the potatoes, and fry them also to a light brown, turning them often; put them into a hot dish, stirring in the minced parsley, and pouring over them any butter that may be left in the pan. Potatoes prepared in this way are liked by almost everyone.

Carrots and Parsnips.—These should be washed and scraped, and boiled like turnips; young ones should be served whole, and large ones cut into quarters lengthwise; boil them tender; season with salt and pepper, and plain melted butter poured over them. Parsnips can be mashed or fried after being boiled. Beets can be used the same way, but they should not be scraped.

Cauliflower.—Wash and trim the cauliflower, and boil it in a bag; when tender break into pieces; place part of them in a dish, cover with butter, bread crumbs, and a little grated cheese; then add more cauliflower, and so on until the dish is full; the top should be covered with bread crumbs, cheese and butter; the last should be plentifully applied; bake to a golden brown.

Spinach.—Pick off the stem of each spinach leaf and avoid using that which is old or yellow; wash it in several waters and put it into a quart of boiling water with a little salt, press it down, and boil it rapidly for ten or twelve minutes; drain it through a sieve; place it in a dish and send it to the table to be eaten with vinegar, hard-boiled egg and mustard.

Green Peas.—The peas should be young, freshly gathered and freshly shelled; put them into lukewarm water and boil them rapidly; when they are tender put in a little salt and pepper, and serve with melted butter. Sugar and a sprig of mint may be added while cooking, if desired.

Asparagus.—Cut off the dry ends and scrape off the outer skin until you reach the tender part, or use very young asparagus; tie it up in a fine cloth; put it into plenty of boiling water, adding a little salt after it has boiled awhile; when done serve on nicely toasted bread, covering the whole with drawn butter. The toast may be omitted and vinegar may be used.

Mushrooms.—Clean and trim the roots of the mushrooms and dip them into melted butter; roll them in cracker dust and brown them in a quick oven; or cut them into quarters, wash them in several waters, and fry them sowly in butter with a little parsley, salt and pepper.

Hominy.—Put half a pound of hominy to soak over night, or put it to cook over a slow fire; then drain off the water and add a pint of milk. It makes a nice dish.

Baked Egg Plant.—Peel the egg plant and cut out a piece from the top; dig out the centre, thus removing the seeds; fill the cavity with a dressing like that for ducks, and replace the top piece; bake an hour, basting with a spoonful of butter melted in a cup of hot water, and dredging with flour after each basting. It should be served as soon as possible after it is prepared.

Egg Plant Fritters.—Peel the egg plant and take out the seeds; boil it in well-salted water for an hour; mash fine and press all the water off through a coarse cloth, and mix in a fritter batter and fry.

Macaroni.—Never wash macaroni. Break it into lengths of three or four inches and throw them into boiling water, allowing a quarter of a pound for every three or four persons; boil for half an hour, and just before it is done put in a little salt, and drain off the water. It may be served plain with tomato sauce, or with drawn butter. It may be baked with milk or grated cheese.

Stewed Tomatoes.—Scald some firm tomatoes and peel off the skin; place in a stewpan and cook slowly with a little water; when tender whip them fine, and season with butter, salt and pepper, and a little flour or cornstarch thickening; serve while hot.

Baked and Stuffed Tomatoes.—Select firm, ripe tomatoes and cut off a thin slice from the stem end; remove the green core and fill them with an onion chopped fine, a small piece of butter, pepper, salt, and a teaspoonful of cracker dust, or bread crumbs; arrange them in a baking-pan; add a little water, and bake in a slow oven; serve them hot in the pan or a warmed dish.

String Beans.—Cut off the ends of the beans and pull off the tough strings; cut them into pieces; put them on in boiling water, with a little salt and carbonate of soda, to preserve their color, and boil them until tender; drain them and place them in a dish with a little salt, pepper and butter. Some persons like a little vinegar with them.

Lima Beans.—Shell and wash the beans, and if old, skin them; put them on to cook in boiling water, and when partly cooked add a little salt; drain them, and season with salt, pepper and a piece of butter; serve them hot in a covered dish.

Green Corn.—1. Husk two dozen ears of corn and remove all the silk, slightly cutting off the edge of the kernels with a sharp knife, and scraping the remainder; place in a pot with two cupfuls of milk, and cook slowly where there is no danger of burning, when ready for the table thin with a little more milk, and season in the dish with salt, pepper and butter to taste.

Green Corn.—2. Strip off all the husks except two or three of the tender inner leaves and clean carefully; then boil on the ear until tender, twelve to fifteen minutes being the time required for young corn; serve hot after removing the leaves.

Corn Fritters.—Take half a dozen ears of corn and free them of all the silk; grate the corn from the cobs, scraping them to get it all off; beat up three eggs very light and add it to the grated corn, then a gill of milk and two tablespoonfuls of flour, salt to taste, and half a teaspoonful of baking powder; put a little lard into a pan, and when hot allow a tablespoonful for each fritter and fry brown; do not have the lard too hot; serve immediately.

Beets.—Wash the beets, but do not peel or even prick them, as the color and sweetness would be lost; put them in boiling water; young beets will cook in two hours; old ones require five or six hours to cook well; peel them with the hand and cut them into thin slices, putting butter, salt and pepper on each slice. When for a pickle, put them into vinegar and a little salt.

Cabbage.—Wash and cut all the coarse sticks from each outside leaf; cut the head into quarters and boil an hour, or until tender; drain and serve as nearly whole as possible. Corned beef or ham, when cooked with it, give it a nice flavor. Serve with vinegar or a vegetable sauce.

Squash.—Peel a spring squash, take out the seeds and core, and cut it into pieces and put it on to boil in a little water; when tender press the water off through a coarse cloth, and then mash it, adding a spoonful of cream, a little butter, pepper and salt to taste; keep hot till used.

Boiled Onions.—Peel the onions and put them on to boil in boiling water; when they are tender pour the water off; add a little butter, pepper and salt to taste, and a little milk; boil them up again, and send to the table hot. They are nice served with turkey or chicken.

Dandelion.—Take the young leaves before the plants blossom or while in bud; wash them clean, and boil them in salted water. They are nice served like spinach. The dandelion is considered very healthy, and the slight bitterness is relished by most persons.

Succotash.—Cut the corn from the cobs of half a dozen ears and cook a little while; then add a pint of lima beans (which are best), or any green bean, and boil an hour in a quart of boiling water, with a little salt and pepper; let the water boil away until only a little remains; then add some milk; season with butter, and serve in a hot dish.

Boiled Rice.—Take a cup of rice, wash it, and put it into a boiler; cover it with water and cook fifteen minutes, stirring it if is likely to stick to the boiler, adding a little salt; then drain, put into a colander, cover again, and steam fifteen minutes. Rice cooked in this way will be white, the grains will swell to their full size, and will be dry and perfectly tender.

DESSERTS AND PUDDINGS.

Rice Pudding.—Take a cupful of rice, put it into a pudding-pan with two quarts of the best milk, half a cup of sugar, a little pinch of salt and half a nutmeg grated over the top; place it in a moderate oven, and as soon as it is brown on top stir it in, stirring the rice up from the bottom; repeat this several times, having it brown each time, but not burnt, and when the rice is tender, and the milk reduced to one quart, add a little piece of butter, and brown again on top; remove as soon as brown, and set away to cool.

Apple and Rice Pudding.—Take some rice, and milk enough to boil it soft; add a little sugar, and some lemon peel, and cinnamon; place it in a double boiler and let it stand over thirty minutes; make some apple sauce, and when the rice is done turn it out into a dish; hollow out the centre and fill it with the apple sauce; beat the whites of three eggs to a froth, and cover the apples with it; sift pulverized sugar over the top and brown it a little in the oven; then serve.

Custard.—Take a quart of new milk and six ounces of sugar; add eight well-beaten eggs and a little salt; flavor to taste, and fill cups with the custard and bake them.

Custard Cream.—Take one pint of cream and five eggs well beaten, five ounces of sugar and a little grated nutmeg; mix all together; place on the fire and stir constantly until it thickens, then remove it from the fire and flavor with pure extract of vanilla; put it in an ice-cream freezer and freeze it. The same mixture is used to fill cream puffs with.

Chocolate Cream Custard.—Scrape a quarter of a pound of chocolate and put it in a teacupful of water boiling hot; let it remain on the fire until dissolved; then add a little sugar, beat six or eight eggs light and save the whites of two; stir by degrees into a quart of milk alternately with the chocolate and three tablespoonfuls of pulverized sugar; flavor with vanilla, and bake ten minutes in cups. This makes a most delicious pudding.

Apple Custard.—Take sour apples, peel, wash and cover them, and cook them in half a cupful of water until a little tender; then take them out, place them in a deep dish, and pour over them the plain custard mixture; then bake for half an hour.

Arrowroot Pudding.—Beat up the yolks of two eggs, boil one-third of a pint of milk with a little sugar; mix a dessertspoonful of arrowroot with a little cold milk until it forms a paste, and pour it into the boiling milk; when nearly cold beat in the eggs; put it into a basin, and boil it quickly for twenty minutes or bake it for half an hour, taking care not to let it burn.

Sago Pudding.—Soak two tablespoonfuls of sago in a little hot milk in a covered basin until soft; add a little grated nutmeg or lemon peel, sugar to taste, and a well-beaten egg; beat all together until thoroughly mixed; butter some cups and pour the pudding into them and boil it.

Plain Sago.—Put a tablespoonful of sago into a saucepan with half a pint of hot water; sweeten to taste, and, if desired, add a glass of port wine, stir it on the fire for a quarter of an hour; serve in a cup or glass. This is a wholesome and nutritious food.

Arrowroot Blanc-Mange.—Mix three tablespoonfuls of arrowroot with one tablespoonful of milk; boil one pint and a half of new milk, sweeten it, and flavor to taste; pour it over the moistened arrowroot and mix them well; put it over a slow fire until it is thoroughly cooked and thickened, stirring all the time; do not let it burn; pour into a mould, and let it stand till next day.

Tapioca Blanc-Mange.—Soak half a pound of tapioca in a pint of milk until a little soft; then boil until tender, adding sugar to taste, and shape it in a mould; turn it out and pour a litle cream around it, jotted with jelly or some kind of jam. The former may be omitted, and lemon or almond may be used. Both ways it is very nice and much relished by the sick.

Tapioca Pudding.—Wash the tapioca and soak it in a quart of milk for two hours, setting it on the back of the stove to soak; beat up three eggs and one cup of sugar together, saving the whites for a meringue, if liked; melt a tablespoonful of butter, add a little salt, and stir into the milk; bake half an hour, or until it is nicely browned on top.

Tapioca Cream.—Take one teacupful of tapioca washed and soaked over night in one pint of warm water; add a little salt and a quart of milk in the morning, and boil in a double boiler for two hours; just before it is done add a little butter, a teaspoonful of vanilla, and three beaten eggs with a cup of sugar; beat the whites of two eggs separately, add a little pulverized sugar, and cover over the top; brown in the oven only a few minutes.

Bread Pudding.—Sweeten one quart of milk with a cup of sugar; a little grated nutmeg and a little salt; add three well-beaten eggs; cut the stale bread into slices and butter it, lay as many pieces on the top as there is room for, and bake it in a pudding-pan; serve a little warm or cold. Raisins may be added, and must be parboiled before.

Cornstarch Pudding.—Take two quarts of milk sweetened with one cup of sugar, place it in a double boiler, and when the milk boils have ready four tablespoonfuls of cornstarch wet with milk and stir it in; keep stirring so that it does not go in lumps; let it cook a while; then add two or three well-beaten eggs, stirring again until it sets; remove from the fire and flavor with vanilla before it cools; cover the top with a meringue and place it in the oven to brown a few minutes. It can be made without eggs if desired.

Oatmeal Pudding.—Mix two ounces of fine Scotch oatmeal in a quarter of a pint of milk, and to it a pint of boiling milk, sweeten to taste, and stir over the fire for ten minutes; then put in two ounces of sifted bread crumbs; stir until the mixture is stiff, then add one ounce of shred suet and one well-beaten egg; add a little flavoring or grated nutmeg; put the pudding into a buttered dish and bake slowly for an hour. It may be served hot or cold.

Cornmeal Pudding.—Stir one cup of cornmeal, a teaspoonful of salt and one cup of molasses together; boil some milk and add the mixture slowly; butter a pudding-dish and pour the pudding in it; set it in the oven and pour one cup of uncooked milk on top; bake three hours in a slow oven.

Bread and Butter Pudding.—Put in a pudding pan a layer of bread crumbs and a layer of tart apples pared, cored and sliced thin; thus alternate until the dish is nearly full; dissolve a cup of sugar and one teaspoonful of ground cinnamon in a pint of boiling water, and pour over the layers; let it stand until the crumbs swell; then put in the oven and bake three-quarters of an hour until brown. Serve with a liquid sauce. It can be made with slices of bread and butter.

Apple Float.—Take six good sour apples, stewed and made into sauce; let them cool, and add a teacupful of sugar, and flavor with vanilla and the beaten whites of three or four eggs. Serve at once.

Charlotte Russe.—1. Make a sponge cake; cut it into pieces to fit the bottom and sides of a Charlotte mould; whip a pint of rich cream to a stiff froth and fill the mould and let it stand on the ice to set. It is improved by the beaten whites of three eggs stirred into the cream. Flavor with vanilla or to suit the taste.

Charlotte Russe.—2. Make a pint of custard—two eggs to the pint of milk; then dissolve a box of gelatine in a pint of water and let it boil as in making jelly; strain each into the same vessel—a tin pan is best—and stir it gently all the while, until it gets cold. In the meantime, take a quart of cream, season with vanilla, sweeten with a pound of sugar, and churn it to a froth; skim the froth and stir it into the mixture as soon as it begins to thicken.

SPECIAL DIETETICS; OR, DIET AS FITTED FOR VARIOUS DISEASES.

In the preceding chapters, dietetics have been fully discussed in a general manner, but as the indications for diet in the several diseases differ somewhat, we will now consider the subject in a special manner, taking up the more common affections and giving their proper treatment from a dietetic standpoint.

FEVERS.

Diet in Acute Diseases.—The proper diet in acute diseases varies somewhat according to the individual affection, but is subject to general principles which are sufficient guides for most cases.

When Food is Not Needed.—In acute febrile diseases which have a very short duration, from one to three days, it is not necessary that the patient take food, as his vitality is strong enough to tide him over. Again, during the first day or two of pneumonia, scarlet fever, or similar affections, there need be no alarm even if the patient take no food, as his strength is sufficient, and often he has absolutely no inclination for food.

When Food is Needed.—But after the fever has been prolonged more than one or two days, then, it becomes necessary to nourish the patient, even though it be against his will, for the tendency to fatal results in all such cases is through exhaustion, and much can be done toward preventing a failure of the vital power by proper feeding.

NOURISH THE PATIENT; DON'T STARVE A FEVER.

Food in Fevers.—The older writers upon dietetics taught that a fever patient was not to be fed, and some modern authors still follow the old teaching. However, fever is *not* a contra-indication to food—to be sure, if the stomach is overloaded with coarse food it will only augment the condition, but if proper care is taken in selecting a diet there will be few bad results and many good ones.

TYPHOID FEVER.

Liquid Foods.—All foods given in protracted febrile states should be in liquid form. This is especially true in typhoid fever, in which disease it should be continued until ten days or two weeks after the temperature has returned to normal.

Milk.—Of all liquid foods, milk is by far the best and most serviceable in typhoid fever. It is taken, if not with relish, at least with less reluctance than other articles, and it has the great advantage of embracing in proper combination all the ailmentary principles required for nutrition.

Pure Milk.—Care should be taken that the milk is of a good quality and comes from healthy cows. In preparing it for the patient it is often necessary that it be iced in order to make it more palatable, or, if it is thought to be questionable in quality, it should be sterilized or boiled.

Diluted Milk.—Should the stomach reject milk when taken as it comes from the dairy it may be diluted with ice-water, lime-water or barley-water. Again, if the regurgitated milk shows signs of non-digestion, it should be artificially digested with peptonizing powder (which can be procured at any pharmacy) before administering to the patient.

Quantity of Milk.—One or two ounces of milk should be taken every three hours during the day, and at night not more than four hours should elapse without food and stimulants being administered. While sleep is essential, yet a patient is not harmed by the partial awakening which is sufficient for the administration of a milk-punch. Again, a careful nurse can give food at frequent intervals without awakening him.

LIQUID MEAT FOODS.

Fresh Meat Juices.—This is the most nutritious of this class, but as a rule it is not taken well by the average patient, owing to its insipid flavor. It may be added to the patient's milk, or used in making broth, about a tablespoonful being given at a time. Beef juice is made by cutting prime, lean beef into small pieces and pressing until all the juice is extracted from the meat. A little salt added to fresh beef juice makes it more palatable.

Beef Tea has an undeserved reputation, for it has but little nourishing property, and to have any effect it must be given in large quantities. It is, however, slightly stimulating.

Liquid Peptonoids are by far the best prepared meat food in typhoid fever, containing as they do the active and nourishing principles of beef, they are especially adapted to the conditions found in typhoid fever. This preparation of beef is manufactured by all reputable pharmaceutical firms, and can be procured from any drug store. It should be given in milk, or alternated with it, every two or three hours, a teaspoonful to a tablespoonful constituting the usual dose.

Soup and Broth resemble beef tea, in that they contain the extractives of meat, but they also contain nutritive substances, but vary greatly according to preparation, the lighter forms of soup being spoken of as broth.

Preparation of Broths.—To prepare broth, use young chicken, lean, fresh beef, or mutton, without fat, allowing the meat to boil slowly for four or five hours (until it falls to pieces), strain, cool and skim off what little fat appears. This liquid may then be seasoned and diluted to the strength required by the patient.

Administration of Broths.—As broths are stimulating as well as nutritious, they should not be administered to a typhoid patient until the third or fourth week, by which time the milk and peptonoid diet will have become exceedingly tiresome, and the new nourishment will be relished and at the same time adapted to the conditions of that period of the disease.

Eggs may be given cautiously throughout the disease in combination with milk as egg-nog, which is made by adding the yolk of an egg to half a pint of milk, with a tablespoonful of whiskey, wine or brandy, and then beating in the white of the egg. This should be given sparingly in any delicacy of the stomach.

Stimulants are given by many physicians throughout the disease, but unless the individual case requires stimulation from the beginning it is best to defer the administration of alcoholics until the middle of the second week, or until the time when the organism requires energetic artificial stimulation.

What Stimulants to Use.—Whiskey, brandy and the light wines can all be used, either slightly diluted in doses from a teaspoonful to a tablespoonful, every two or three hours, or incorporated with the medicine or food. As mentioned above, whiskey or brandy can be given in the form of egg-nog, or milk-punch, thus exhibiting both the stimulating effects of the liquor and the nourishment of the milk and eggs. A light, powerfully stimulant beverage is made by the addition of champagne to milk, and is especially applicable to a weak stomach.

Feeding by Enema.—In extremely serious cases of typhoid fever, or when the stomach will not retain proper nourishment, it is often necessary to sustain strength by rectal feeding, For this purpose, strong, black coffee, solutions of beef peptonoids, beef tea, beaten eggs and milk, etc., are injected well up into the intestine by means of a long rectal tube. In this form of feeding a very much larger quantity of food should be used than by the mouth.

Diet of Convalescence.—After the acute symptoms have all subsided and the temperature has been normal for ten days or two weeks, the diet may gradually be increased. For the first few days boiled rice, cornstarch pudding, oat-meal porridge or sago porridge may be given in small quantities. This may be followed by a portion of a soft boiled or poached egg, or milk toast made from old bread. On the fifth or sixth day a little dry toast with a baked apple or potato may be eaten; this can be followed by finely chopped lean beef, broiled, and light bread which is a day or two old, with a little fresh butter.

Increase of Diet.—From this diet gradually increase to a tender piece of chop or steak, small quantities of well-cooked green vegetables, and so forth, always remembering that the seat of the disease is in the intestine, and standing ready to cut the diet down on the appearance of diarrhœa, a return of fever, or other unfavorable symptom.

During convalescence it is not usually advisable to continue the use of stimulants, although the malt liquors, as ale, porter and malt extract are at times beneficial.

CEREBRO-SPINAL FEVER.

Cerebro-Spinal Typhus, Meningitis, Spotted Fever.

Generous Diet Needed.—This disease may be very rapid in its course and terminate in from four to seven days, or again, it may continue for six or eight weeks, according to the length of its stages and their particular conduct. Consequently a generous and sustaining diet must be inaugurated from the onset.

Items of Diet.—Milk, eggs, beef juice, liquid peptonoids, mutton broth, and so forth, should be given every three hours, day and night, to avoid paroxysms of weakness in the early morning. Very often food cannot be taken by the mouth, in such cases nutritious enemata should be used as in typhoid fever. The alcoholic stimulants: whiskey, brandy, wine, and so forth, should be given freely every few hours.

PERNICIOUS FEVER.

Pernicious Malarial Fever. Congestive Fever.

Full Diet Needed.—The diet in pernicious malarial fever should be full; plenty of meat, milk and eggs. During the attacks it should be cut down to liquid food, often repeated. In the gastro-enteric variety of the disease the diet should be the same as in acute dysentery.

INFLUENZA.

La Grippe. Contagious Catarrh.

Diet Required.—Food consisting of milk and eggs should be administered at frequent intervals and in most cases, especially in elderly individuals, alcoholic stimulants should be given. When the pulse is soft and the stomach irritable, champagne will be found to be a most serviceable remedy.

Diet in Convalescence.—The prostration and loss of strength is very great after an attack of influenza, even though the duration has been short; and convalescence must be watched with much care. The diet should be increased as soon as possible to thick soups, rare beef and mutton and the easily digested vegetables. Malt liquors, porter, ale, stout, and so forth, are often indicated.

The rapid increase of consumption since the advent of influenza, a few years since, is very significant: convalescing patients should receive the most nourishing of food, in order to fortify the organism against any tendency to chronic complications.

SCARLATINA.

Scarlet Fever.

A Supporting Diet Needed.—As this disease runs a rapid, definite course, the diet must be supporting and nourishing from the start; milk, beef peptonoids and eggs fulfilling the indications. Alcoholic stimulants are indicated in proportion to the frequency and feebleness of the pulse, together with general prostration. Alcoholics are to be given with discrimination however, their precise effects being noticed. The malignant type of the disease requires that stimulants should be used freely. In children, wine-whey, milk-punch and egg-nog are eligible forms for their administration.

Water Diet.—If the urine is scanty and high colored, the patient should be permitted to drink of water very freely, also milk and lime-water and cream-of-tartar lemonade, in order to promote proper renal secretions.

DIPHTHERIA.

Putrid Sore Throat. Malignant Quinsy.

Milk Diet Required.—The diet should be concentrated and highly nutritious from the onset, embracing the necessary variety of alimentary principles. Milk meets preëminently these requirements.

Difficulty of Nutrition.—A serious difficulty in the treatment often arises from the invincible repugnance to nutriment, and sometimes from the persistence of vomiting. Owing to the difficulty of alimentation in such cases, and sometimes a want of appreciation of its importance, death takes place from innutrition.

Items of Proper Diet.—Milk, eggs, broth, peptonoids, beef juice or essence, peptonized oysters, eggnog or milk-punch should be given at intervals of every two or three hours. If swallowing is so difficult as to prevent the patient from taking a proper amount of food, resort must be had to nutritious enemata. The following is a suitable formula:

Milk	1	ounce
Whiskey	½	"
Egg	1	

Add a little salt, beat up and warm.

Stimulants.—Stimulants should be used boldly from the start, guiding the dose by the effects. It is surprising to observe the large amount which can be taken even by the tenderest subject, without bad results. Usually a child of two years requires from thirty to sixty drops of whiskey or brandy every two or three hours; an adult, from two to three teaspoonfuls every three hours. However, this amount can be greatly increased if necessary. It is a mistaken idea to wait until symptoms of debility appear in diphtheria before using alcoholic stimulants.

Measles.—The diet needs nothing more than casual mention. Milk constitutes the chief article of diet, especially if there is a trace of albumen in the urine. Iced drinks, calf's-foot jelly, custards, rice and tapioca pudding are very acceptable to the little patient, and can be given in moderation. Stimulants are seldom required.

Constipation.—Above all other means for removing constipation are those hygienic applications derived from the natural stimulus of the intestinal movements—food. If there be no contra-indications, those foods which leave a considerable residuum—as Graham flour, bran, rye and corn bread, groats, oatmeal, cracked wheat and oats, and so forth—can be used with advantage; fresh vegetables as lettuce, spinach, celery, onions, the various vegetables known as greens, and so forth, and fruits as apples, dried peaches, figs, dates, tamarinds, prunes, and so forth.

A large draught of plain or carbonated water should be taken before breakfast. The alkaline mineral waters, as Saratoga, Pullna or Hunyadi, taken in this way usually give excellent results. As a sedentary life induces constipation, it follows that sufficient excercise must be enjoined in all such cases.

Diarrhœa.—The diet, in quality and quantity should of course be adapted to the digestive powers. Chickens, eggs and tender meats plainly cooked are most likely to be digested; but as before mentioned a milk and farinaceous diet is found to be preferable. Crude vegetables are to be interdicted, but ripe fruits in moderation may frequently be taken without inconvenience and with advantage.

Cholera Infantum.—In a "hand-fed" child boiled flour, powdered biscuit or barley water may be added to the milk. Very often in such children who have been judiciously fed, the meat foods will be found to act better than milk. Thin broths, beef tea, beef juice, liquid peptonoids or raw scraped beef are used generally with much benefit.

Dysentery.—As in this disease the nutrition suffers severely the correct diet is important from the beginning. If the stomach is irritable, milk, with one-fourth lime-water, is the best food. If there is but little nausea, and especially if the digestion remains good, the patient can take milk, eggs, beef juice (which is particularly adapted to this condition), ice cream, boiled custard, oyster soup, mutton, chicken and beef broth, and similar articles. But solids leaving much residuum, and especially coarse articles, are highly objectionable.

Pneumonia.—Food must be carefully administered from the beginning without waiting for depression to come on. Beef juice, milk, milk-punch, egg-nog, wine-whey, mutton or chicken broth, liquid peptonoids should be given systematically every three hours. In weak subjects stimulants are necessary from the onset.

Consumption.—The diet should be generous as regards quality, quantity and variety, the articles of food being highly nutritious and adapted to the digestive powers. All the varieties of wholesome food which the patient is able to take with relish should be allowed, and the appetite should be encouraged as much as possible.

Chronic Bright's Disease.—The nutrition of the patient is of the first consequence. The diet should be simple and consists of milk, eggs, a little fresh meat (once a day) and fruits, if diarrhœa does not exist.

Rickets.—Good cow's milk, diluted by one-third to one-fourth of lime-water is the most suitable food. In older children the food should contain an abundance of animal fat, nitrogenous principles, and salt. The quantity of animal fat should amount to at least one-fourth of all the solid food taken, the nitrogenous food to one-third, and the starches to one-third. The fat is best administered in the form of cream or rich milk, but if this cannot be obtained cod-liver oil may be substituted. Raw or beef cooked very rare is one of the best articles of food in this disease for older children.

Gouty.—Gouty patients may, for the purpose of dietetic discussion, be arranged in three classes: first, those who are robust and vigorous; second, those who with a distinct feebleness of constitution and sluggishness of habit have a marked tendency to the accumulation of fat; third, those whose nutrition and general vital forces are habitually on a low level.

In robust gouty persons it is essential that the quantity of food be lessened; such persons should be taught to habitually rise from the table with the appetite not entirely satisfied. In the second class of patients some control over the appetite is not rarely imperative, while in the third class of patients it is often equally essential to administer food beyond the cravings of the stomach.

What to Avoid.—There are certain articles of food which should be denied to all gouty subjects. First of these is cane sugar, acid fruits, including the tomatoes and strawberries, are also to be avoided by all gouty subjects, while non-acid fruits, if ripe, are almost invariably of great service and should be taken freely. The harm done by acid fruits is largely due to their irritating effects upon the organs of digestion.

Nervous Affections.—Nervous prostration; nervous exhaustion. The question of feeding is one of great importance, and requires the utmost care and attention; the end to attain is to feed the patient as much as can be digested, but not to overfeed and derange the digestion.

Food should be given at intervals of two or three hours, and must be both light and nutritious. It should, at least at first, consist largely of milk, except in those rare cases in which this fluid does really disagree with the stomach and is not merely thought to do so. The milk should be skimmed or given in the form of koumiss.

Beef juice, or other concentrated meat essences are valuable as stimulants, and may be used as the basis of soups. Various farinaceous articles of food may be added to them; if an egg be broken into the concentrated bouillon or beef essence just as it ceases boiling, a nutritious and palatable dish is obtained. When constipation exists, oatmeal porridge, Graham bread and fresh or dried fruits may be allowed if they are readily digested by the patient.

Full and Low Diets.—The terms "full diet" and "low diet" are often used by physicians in their directions to nurses. Pavy gives the full or extra, the middle or ordinary, and the low diet of Guy's Hospital as follows:

Full or Extra Diet.—Fourteen ounces of bread; one pint of porter for males, half a pint of porter for females; six ounces of dressed meat, roasted and boiled, alternately, with eight ounces of potatoes; half a pound of rice pudding three times a week; half a pint of mutton broth in addition on days when boiled meat is given (which is four times a week); or, occasionally, one pint of strong vegetable soup, with meat and rice pudding, twice a week; one ounce of butter each day; porridge, gruel and barley water as required.

Middle or Ordinary Diet.—Twelve ounces of bread; half a pint of porter; four ounces of dressed meat roasted and boiled, alternately, with eight ounces of potatoes; half a pound of rice pudding three times a week; half a pint of mutton broth in addition on days when boiled meat is given (which is four times a week); or, occasionally, one pint of strong vegetable soup with meat and rice pudding, twice a week; with the full diet allowance of bread; one ounce of butter each day; porridge, gruel and barley water as required.

Low Diet.—Ten ounces of bread; half a pint of beef tea, mutton broth, rice, arrowroot, or sago, when specially ordered; three-quarters of an ounce of butter; gruel and barley water as required. Wines and spirits, if used, must be mentioned each time the physician or surgeon attends.

GENERAL HOUSEHOLD RECIPES.

To Purify Sinks and Drains.—To one pound of common copperas add one gallon of boiling water, and use when dissolved. The copperas is deadly poison, and should always be carefully labeled if kept on hand. This is one of the best possible cleansers of pipes and drains.

To Wash Greasy Tin and Iron.—Pour a few drops of ammonia into every greasy roasting-pan, after half filling the pan with warm water. A bottle of ammonia should always be kept on hand near the sink for such uses; never allow the pans to stand and dry, for it doubles the labor of washing, but pour in water and use the ammonia, and the work is half done.

To Clean Carpets.—Shake and beat the carpets well; lay them upon the floor and tack them firmly; then with a clean flannel wash them over with one quart of bullock's gall mixed with three quarts of soft, cold water, and rub it off with a clean flannel or house-cloth. Any particularly dirty spot should be rubbed with pure gall. Carpets cleansed in this way look bright and fresh.

Treatment of Oilcloth.—Oilcloth ought never to be wet, but merely rubbed with a flannel and polished with a brush of moderate hardness, exactly like a mahogany table; and by this means the fading of the colors and the rotting of the canvas are entirely avoided.

To Remove Iron Stains from Marble.—Wet the spots with oil of vitriol, or oxalic acid diluted in alcohol, or with lemon juice, and after a quarter of an hour, rub them dry with a soft linen cloth.

To Clean Marble.—Use three ounces of pearl ash, one pound of whiting, and three pints of water well mixed together, and boil for ten minutes; rub it well over the marble and let it remain twenty-four hours, then rub it off, and dry with a clean cloth.

To Clean Woodwork.—Where painted wainscot or other woodwork requires cleaning, fuller's earth will be found cheap and useful, and on wood not painted it forms an excellent substitute for soap. Where extreme nicety is required, use a mixture of one pound of soft soap, two ounces of pearl ash, one pint of lard, and one pint of table beer; simmer these substances in a pipkin over a slow fire, and let them be well mixed. The mode of application is to put a small quantity in flannel; rub it on the wainscot, wash it off with warm water and dry thoroughly with a linen cloth. This will clean painted woodwork without removing the paint.

To Clean Gilt Frames.—When the gilt frames of pictures or looking-glasses, or the gilt mouldings of rooms have specks of dirt upon them, from flies or other causes, they can be cleaned with the white of an egg gently rubbed on with a camel's-hair pencil.

To Clean Picture Frames.—Black walnut frames will become dull and rusty looking. They may be renewed by first brushing thoroughly with a stiff brush to remove dust, and then applying pure linseed oil with a proper brush, or with a piece of new bleached muslin.

To Remove Moths from Furniture.—Moths may be exterminated or driven from upholstered work by sprinkling it with benzine. The benzine is put in a small watering-pot, such as is used for sprinkling house-plants; it does not spot the most delicate silk, and the unpleasant odor passes off in an hour or two in the air. Care must be used not to carry on this work near a fire or flame, as the vapor of benzine is very inflammable. It is said that a little spirits of turpentine added to the water with which floors are washed will prevent the ravages of moths.

Perfume and a Preventive Against Moths.—Take one ounce of Tonquin beans, caraway seed, cloves, mace, nutmeg, cinnamon, well ground; add six ounces of Florentine orris root; mix well, and put in bags among your clothes.

To Blacken Hearths.—Mix black lead and whites of eggs, well beaten, together; with a painter's brush wet the hearth thoroughly all over; then rub it bright with a hard brush.

To Remove Fly Spots.—Dip a camel's hair brush into spirits of wine, and apply it to remove fly spots.

Mucilage.—An excellent mucilage may be made by taking one ounce of gum tragacanth, as much corrosive sublimate as will lay on a silver five-cent piece; put it into a jar and pour over it one quart of cold, soft water; let it stand twenty-four hours; then stir, and it is ready for use, and it will keep as long a time as is desired.

Liquid Glue.—Dissolve 33 parts of best glue, in a steam bath, in 36 parts of water; then add gradually, stirring constantly, 3 parts of nitric acid, or enough to prevent hardening when cool.

How to Keep Meat.—Meat is much better for family use when at least one week old, in cold weather. Hang up a quarter of meat with the cut end up, the reverse of the usual way, and the juice will remain in the meat and not run to the cut and dry up by evaporation.

To Restore and Preserve Flowers.—Faded flowers may be generally more or less restored by immersing them half way up to their stems in very hot water, and allowing them to remain in it until it cools, or they have recovered. The scalded portion of the stem must then be cut off, and the flowers placed in clear, cold water. In this way a great number of faded flowers may be restored; but there are some of the more fugacious kinds on which it proves useless. Flowers may also be preserved and their tints deepened by adding to the water a little solution of carbonate of ammonium and a few drops of phosphate of sodium. The effect of this in giving the flowers a deeper color and a stronger appearance is quite wonderful; and, by cutting off every other day about half an inch of the stems of the flowers with a sharp knife, they may be kept as long as their natural life would last in the fields or woods. If a spoonful of charcoal powder be added to the water, the flowers will last as long as they would on the plant without any need of changing the water.

To Clean Mica.—Take a little vinegar and water and apply with a soft cloth. The acid removes the stains, and if well done and wiped dry will look as good as new. If the stove is hot, tie the cloth to a stick.

Silver Polish.—Cream of tartar, two ounces; prepared chalk, two ounces; pulverized alum, one ounce. Water sufficient to make a paste. Apply with soft cloth, allow to dry and polish with flannel.

Flannels.—Flannel should always be washed with white soap, and in warm, but not boiling water.

Damp Closets.—For a damp closet or cupboard, which is liable to cause mildew, place in it a saucerful of quicklime, and it will not only absorb all apparent dampness, but sweeten and disinfect the space. Renew the lime once a fortnight; if the place be very damp, renew it as often as it becomes slaked. Lime may be used in the same way for water-closets and out-buildings.

Damp Walls.—Line the damp part of the wall with sheet lead rolled very thin, and fastened up with small copper nails; it may be immediately covered with paper, and so hidden from view. The lead is not to be thicker than that which lines tea chests.

Whitewash for Rooms.—Take four pounds of whiting and two ounces of common glue; let the glue stand in cold water over night, then heat it until dissolved and pour it hot into the whiting mixed with cold water. This makes a nice, smooth whitewash.

Whitewash that will not Rub Off.—Mix up half a pailful of lime and water ready to put on the wall; then take one-fourth pint of flour, mix it with water, then pour on it a sufficient quantity of boiling water to thicken it, and pour it while hot into the whitewash; stir all well together and use.

Painting and Papering.—Painting and papering are best done in cold weather, especially the former, for the wood absorbs the oil of paint much more in warm weather, while in cold weather the oil hardens on the outside, making a coat which will protect the wood instead of soaking into it.

Lamp Chimneys.—To prevent cracking, put them into a kettle of cold water, gradually heating to the boiling point, and then let them as gradually cool.

Roach Exterminator.—Borax is one of the best exterminators. It should be pulverized and sprinkled around the infested places. Red lead made into a paste with flour and brown sugar and spread on small pieces of card distributed at night about infested places is also said to be good.

To Remove Old Putty.—Old putty, it is said, can be removed without injury to the sash or glass by passing a hot soldering iron over it. The heat of the iron softens it rapidly.

Testing Butter.—Melt some suspected butter; soak a wick in it; when cold, light it like a candle and then blow it out. If oleomargine it will smell like a blown-out candle, if it is butter it will smell like butter.

To Remove a Tight Ring.—Envelop the finger in a length of flat rubber braid, beginning at the tip of the finger and laying it on closely and tightly, so as to exert its elastic force gradually and gently upon the tissues. When the binding is completed, the hand should be held up and in a few minutes the swelling will be perceptibly diminished. The braid is then taken off and immediately reapplied in the same manner, when, after another five minutes, the finger, if again rapidly uncovered, will be small enough for the ring to be removed with ease.

For Cleaning and Polishing Furniture, Hard Wood, Leather, Etc.—One-third pure lard oil, two-thirds benzine. Mix. Rub with woolen cloth.

To Remove Iron Rust from White Goods.—Try salts of lemon. Buy it from your druggist and keep it out of the children's way. Wet the stains, rub in the salts of lemon and lay goods in the hot sun. If the first application does not entirely remove the iron mold, renew it, always leaving in the sunlight for some time.

TOILET ARTICLES.

To Clean Hair Brushes.—Dissolve a piece of soda in some hot water, allowing a piece the size of a walnut to a quart of water; put the water into a basin, and, after combing out the hair from the brushes, dip them, bristles downward, into the water and out again, keeping the backs and handles as free from water as possible. Repeat this until the bristles look clean; then rinse the brushes in a little cold water; shake them well, and wipe the handles and backs with a towel, *but not the bristles*, and set the brushes to dry in the sun, or near the fire. Wiping the bristles of a brush makes them soft, as does also the use of soap.

To Clean Combs.—If it can be avoided, never wash combs, as the water often makes the teeth split, and the horn, if wet, often becomes rough. A small brush can be bought, made purposely for cleaning combs; with this the comb should be well brushed, and afterward wiped with a cloth.

Bandoline.—Soak starch or Irish moss (whichever is handy) in rose water until dissolved and smooth; if you wish it to be pink, color it with a little pounded cochineal.

Oil of Roses for the Hair.—Attar of roses one drachm, oil of rosemary one drachm, olive oil one quart, mixed together. It may be colored red by steeping a little alkanet root in the oil (with heat) before scenting it.

Milk of Roses.—Put into a small bottle two ounces of rose water, one teaspoonful of oil of sweet almonds, ten drops of oil of tar. Shake the bottle until the whole is combined; it makes a nice and perfectly harmless cosmetic to apply to the skin after washing.

Marrow Pomade for the Hair.—Marrow a quarter pound, lard a quarter pound, caster oil six ounces, salad oil six ounces, palm oil half ounce, scent with oil of bergamot; melt the lard and palm oil together, then strain it, and strain the marrow; mix all well together, until nearly cold and put in pots.

Perfume for Linen.—Lavender flowers half pound (free from stalk), dried thyme and mint, of each, half ounce, ground cloves and caraway, of each, a quarter ounce, common salt dried one ounce; mix well together, and put into cambric or silk bags.

Chapped Hands.—Unsalted lard a quarter pound, yolks of two new-laid eggs, rose water to mix well; add a large spoonful of honey, and enough of fine oatmeal or almond flour to work it into a paste.

Chapped Lips.—Borax, benjamin, and spermaceti, of each, a quarter ounce, a pinch of alkanet root, a large juicy apple chopped, a bunch of black grapes bruised, a quarter pound of unsalted butter, two ounces of bees wax; put all into a new tin saucepan; simmer gently till the wax, etc., are dissolved, and then strain it through a linen; when cold, melt it again and pour it into small pots or boxes; or, if to make in form of cakes, use the bottom of teacups.

Excessive Sweating of the Hands or Feet.—A useful prescription for excessive sweating of the hands and feet is: Carbolic acid 1 part, burnt alum 4 parts, starch 200 parts, French chalk 50 parts, oil of lemon 2 parts; sprinkle on feet, or inside of stockings or gloves, etc.

Chilblains.—Wash the chilblains with tincture of myrrh diluted in a little water.

Burns.—Lime water beaten up with sweet oil is an excellent ointment for painful burns.

Sprains.—Sal ammoniac half an ounce, rose water half pint, cologne water a tablespoonful. Rags wet with the lotion should be laid on the injured part, and changed when they get dry.

Sunburn.—This may occur in grade from a slight reddening of the face to an inflammation attended with blistering. Soothing applications and avoiding the cause are the indications. Oxide of zinc ointment, cosmoline and zinc ointment, in equal parts, or dusting powders of starch or rice flour, are useful. A solution of subnitrate of bismuth, or bicarbonate of soda, has some value for removing freckles. Powdered nitre, moistened with water and applied to the face night and morning, has also been recommended for removing freckles.

To Remove Blackheads.—Use hot water, a pure vegetable oil soap and a rough wash-cloth faithfully and vigorously at least twice a day. The friction will also help to rid you of the enlarged pores. The following ointment applied directly after washing the face is excellent for softening the obnoxious little "flesh worms." Allow it to remain on all night or at least three or four hours, and then scrub off with soap and warm water: Ergotine six grammes, oxide of zinc fourteen grammes, vaseline sixty grammes.

For Obstinate Cases of Blackheads.—For very obstinate cases of blackheads anoint the face with tincture of green soap after washing it with hot water. Let the soap remain on for a few minutes, then rinse it off with warm water. A few weeks treatment will soften the skin so that all of the blackheads, which have not already succumbed to the action of the soap and water, can be easily pressed out with the fingers. The green soap may make the face very tender. In that case apply some soothing cream or lotion directly after using it. The following is excellent: Rose water two ounces, almond oil two ounces, white wax one-half ounce, spermaceti one-half ounce.

To Remove Freckles.—Try the following: Bichloride of mercury two grammes, sulphate of zinc four grammes, spirits of camphor five grammes, distilled water one hundred and fifty grammes. Dilute with three parts of water and apply to the spots with a piece of soft linen at night. Label the bottle plainly with red ink, as bichloride of mercury is a poison and should be handled discreetly. It will not, however, injure your face in the least when used as here directed.

For Pimples on the Face.—Camphor ten grains, acacia (pulverized) twenty grains, sulphur (precipitated) two drachms, lime water two ounces, rose water two ounces. Apply to the face with a soft cloth at bed-time. Allow to dry and brush off the excess of powder.

For Chapped Hands and Face.—Compound tincture of benzoin ten drops, alcohol two drachms, rose water one-half drachm, glycerine one ounce. Apply to chapped surfaces at night after they have been washed with soap and warm water and thoroughly dried.

TABLE OF MEDICINES AND DOSES.

No fixed rule can be applied to dosage for various reasons. Primarily because one individual may be more readily affected by drugs than another, or the drugs may be so antagonized by the disease process as to render very large doses necessary. Therefore, dosage must be varied to suit the case, and taking into consideration age and sex.

The following table gives a full list of medicines ordinarily used, with their properties and the doses suitable for adults. The dose for a child may be determined, excepting in a few dangerous medicines, by this rule: *Add twelve to the child's age in years and divide the sum by the child's age. The quotient shows what proportion of the dose for an adult is to be used.* Thus:

Child's age in years.......................... 6
Add 12
Divide by child's age......................6)18(3

and the dose for a child of six years is found to be one-third of the dose for an adult. This rule is not a law, however, for of narcotics children should receive less than this (one-half), and of purgatives or laxatives more than this (say two or three times).

Medicines and Properties.	Doses.
Acetanilid; febrifuge, anodyne	1 to 5 grains
Aconite leaves, tincture of; narcotic, sedative and nauseant	10 to 15 drops 3 times a day
Aconite root, tincture of; narcotic, sedative and nauseant	1 to 5 drops 3 times a day
Aconite root, fluid extract of; narcotic and sedative	1 to 3 drops 3 times a day
Aconite root, solid extract of; narcotic and sedative	¼ to ½ grain 3 times a day
Aloes socotrine, powdered; purgative	5 to 10 grains
Aloes socotrine, pills of; purgative	2 to 3 pills at bedtime
Aloes socotrine, tincture of; purgative	1 to 3 drams at bedtime
Aloes and myrrh, tincture of; emmenagogue	1 to 2 teaspoonfuls 2 or 3 times a day
Aloes and myrrh, pills of; emmenagogue	3 or 4 pills twice a day
Alum, powdered; astringent and emetic	3 to 30 grains
Alum, burned; escharotic	10 to 15 grains moistened with water applied externally
Ammonia, carbonate of; stimulant	5 to 6 grains every 2 to 4 hours
Ammonia, water of (spirits of hartshorn); stimu. and caustic	8 to 12 drops diluted with water.
Ammonia aromatic, spirits of; stimulant	10 to 20 drops diluted in water
Ammonia liniment (volatile); rubefacient	applied externally
Ammoniac mixture; expectorant	tablespoonful 3 or 4 times a day
Ammonium chloride; expectorant	5 to 10 grains
Angelica root, fluid extract of; stimulant and aromatic	teaspoonful 3 or 4 times a day
Angelica root, decoction of; stimulant and aromatic	wineglassful 2 to 4 times a day
Anise-seed, essence of; aromatic and carminative	1 to 2 tablespoonfuls

MEDICINES AND PROPERTIES.	DOSES.
Antimonial wine; emetic	2 to 3 teaspoonfuls
Antipyrine; febrifuge	5 to 10 grains
Arrowroot, Bermuda; nutritive and tonic	as a gruel
Arsenic, Donovan's compound solution of; alterative	5 to 10 drops 3 times a day
Arsenic, Fowler's solution of; alterative and febric	1 to 5 drops 3 times a day
Asafetida, pills of; anti-spasmodic	1 to 2 pills
Asafetida, milk of; anti-spasmodic	1 to 2 teaspoonfuls
Asafetida, tincture of; anti-spasmodic	25 to 40 drops
Balsam of copaiva; diuretic, laxative and stimulant	20 to 30 drops 3 times a day
Balsam of fir; diuretic	10 to 15 drops
Balsam of Peru; stimulant and tonic	5 or 10 drops twice a day
Balsam of tolu, tincture of; stimulant and tonic	20 to 40 drops
Belladonna, fluid extract of; diaphoretic, diuretic and narcotic	3 to 5 drops
Belladonna, tincture of; diaphoretic, diuretic and narcotic	10 to 20 drops
Belladonna, plaster of; anodyne and diaphoretic	applied externally
Belladonna, ointment of; anodyne	applied externally
Bismuth, subnitrate of; anti-spasmodic, absorbent, sedative	5 to 10 grains twice a day
Bitter sweet, fluid extract of; emetic and narcotic	30 to 40 drops 3 times a day
Black drop (vinegar of opium); narcotic	10 to 12 drops
Black cohosh, decoction of; narcotic, diaphoretic and diuretic	wineglassful 3 times a day
Black cohosh, tincture of; narcotic, diaphoretic and diuretic	teaspoonful 3 or 4 times a day
Black hellebore, fluid extract of; hyd., cath. and emm.	10 to 15 drops 3 or 4 times a day
Blackberry root, decoction of; astringent and tonic	wineglassful 3 or 4 times a day
Blackberry root, fluid extract of; astringent and tonic	teaspoonful 3 times a day
Blackberry root, syrup of; astringent	tablespoonful 3 to 6 times a day
Blue vitriol; emetic	1 to 3 grains
Blue mass pills; alterative and sialagogue	1 or 2 pills (5 grains each)
Boneset, infusion of; stimu., sudorific and emm.	1 to 2 tablespoonfuls 3 or 4 times a day
Boneset, fluid extract of; stimulant, sudorific and emm.	30 to 40 drops 3 or 4 times a day
Borax, powdered; nephritic and deterient	15 to 25 grains
Buchu, infusion of; diaphoretic and diuretic	tablespoonful 4 or 5 times a day
Buchu, fluid extract of; diaphoretic and diuretic	teaspoonful 3 or 4 times a day
Buchu, tincture of; diaphoretic and diuretic	1 to 2 teaspoonfuls 3 or 4 times a day
Buckthorn, fluid extract of; hydragogue cathartic	teaspoonful at bedtime
Burdock, fluid extract of; herpetic anti-scorbutic	tablespoonful
Calomel; alterative and laxative	½ to 5 grains
Camphor, gum; anti-spasmodic and sedative	2 to 5 grains
Camphor, spirits of; anti-spasmodic and sedative	10 to 25 drops
Camphor, water of; anodyne and sedative	2 to 4 teaspoonfuls
Calamus root, fluid extract of; aromatic, stimulant and stomachic	teaspoonful
Caraway seed, infusion of; aromatic and carminative	tablespoonful
Cardamom seed, tincture of; aromatic and stimulant	1 to 2 teaspoonfuls
Cardamom, compound tincture of; stomachic	1 to 2 teaspoonfuls
Cascara sagrada, fluid extract of; tonic laxative	10 to 30 drops
Catechu, powdered; astringent	15 to 30 grains
Catechu, tincture of; astringent	10 to 30 drops
Catnip, decoction of; diaphoretic, stomachic and corrective	tablespoonful
Cayenne pepper, powdered; stimulant	3 or 6 grains
Cayenne pepper, tincture of; stimulant	10 to 15 drops
Castor oil; purgative	1 to 2 tablespoonfuls
Chamomile flowers, cold infusion of; tonic and stomachic	1 to 2 tablespoonfuls 3 times a day.

Medicines and Properties.	Doses.
Chalk, prepared; antacid and astringent	10 to 30 grains in mucilage
Chalk mixture; antacid and astringent	2 or 3 teaspoonfuls
Chloroform; narcotic and sedative	10 to 60 drops in mucilage
Chloroform, liniment of; anesthetic and anodyne	applied externally
Cinnamon, powdered; astringent and stomachic	5 to 15 grains
Cinnamon, oil of; astringent and stomachic	2 to 4 drops
Cinnamon, essence of; astringent and stomachic	20 to 25 drops
Cloves, powdered; aromatic, carminative and stimulant	10 to 15 grains
Cloves, oil of; stimulant, aromatic and carminative	1 to 5 drops
Colombo root, decoction of; tonic	tablespoonful 3 times a day
Colchicum root, wine of; narcotic, diuretic and sedative	10 to 30 drops 3 times a day
Colchicum seed, tincture of; narcotic, diuretic and sedative	10 to 30 drops 3 times a day
Corrosive sublimate; antisyphilitic	1-60 to ⅛ grain 2 or 3 times a day
Cotton root, fluid extract of; emmenagogue, parturient and abortive	20 to 30 drops
Cream tartar; aperient and refrigerant	teaspoonful in water
Cubebs, powdered; stimulant and diuretic	20 to 30 grains
Cubebs, fluid extract of; stimulant and diuretic	20 to 40 drops
Cubebs, tincture of; stimulant and diuretic	1 to 2 teaspoonfuls
Cubebs, oil of; stimulant and diuretic	10 to 12 drops on sugar
Dandelion, fluid extract of; alterative, aperient, tonic and diuretic	1 to 2 teaspoonfuls
Dogwood bark, decoction of; tonic, astringent and stimulant	wineglassful 2 or 3 times a day.
Dover's powder; diaphoretic	5 to 15 grains at bed-time
Elder flower, decoction of; alterative, diaphoretic and diuretic	1 to 2 tablespoonfuls
Elm bark, infusion of; demulcent and diuretic	wineglassful
Epsom salts; cathartic	2 or 3 teaspoonfuls before breakfast
Ergot, powdered (fresh); astringent	15 to 30 grains
Ergot, fluid extract of; astringent	15 to 60 drops
Ergot, tincture of; astringent	1 teaspoonful
Ergot, wine of; astringent	1 teaspoonful
Fennel seed, infusion of; aromatic and carminative	tablespoonful
Fennel seed, oil of; aromatic and carminative	3 to 6 drops
Fever-root, decoction of; diuretic, cathartic and emetic	tablespoonful
Flaxseed, infusion of; demulcent	wineglassful every 3 or 4 hours
Flaxseed, poultice of; astringent	excellent for drawing
Flaxseed, oil and lime-water; astringent	applied to scalds and burns
Foxglove, powdered (digitalis); diuretic, narcotic and sedative	½ to 1 grain 2 or 3 times a day.
Foxglove, tincture of; diuretic, narcotic and sedative	5 to 15 drops 2 or 3 times a day
Garlic, syrup of; expectorant	1 to 2 teaspoonfuls
Gaultheria, oil of (wintergreen); antirheumatic	2 to 10 drops
Gentian, tincture of; tonic	1 teaspoonful
Ginger, powdered; stimulant and carminative	20 to 30 grains
Ginger, tincture of; stimulant and carminative	15 to 30 drops
Glauber salts; aperient and cathartic	1 to 2 teaspoonfuls before breakfast
Gelsemium, fluid extract of; narcotic, sedative, diaphoretic and febrifuge	2 to 5 drops
Gelsemium, tincture of; narcotic, sedative, diaphoretic and febrigue	5 to 10 drops
Gum arabic, mucilage of; demulcent	tablespoonful every 3 or 4 hours
Guaiacum, tincture of; diaphoretic and diuretic	teaspoonful 2 or 3 times a day
Henbane, tincture of; narcotic and anodyne	15 to 30 drops
Henbane, fluid extract of; narcotic and anodyne	5 to 15 drops
Hoarhound, decoction of; sudorific, pectoral, aperient and tonic	tablespoonful
Hoarhound, syrup of; sudorific and pectoral	tablespoonful
Hops, tincture of; nerve tonic and sedative	1 to 2 teaspoonfuls every 4 hours
Hydrastine (active principle of yellow root); astringent, tonic, stomachic, antibilious	1 to 2 grains.

MEDICINES AND PROPERTIES.	DOSES.
Hypophosphites, syrup of; tonic	½ to 1 teaspoonful 3 times a day
Iodine, tincture of; alterative and discutient	applied to scrofulous tumors
Iodine, ointment of; discutient	applied to scrofulous tumors
Iron, carbonate (rust) of; tonic	5 to 10 grains
Iron, syrup of iodide of; alterative, diuretic and tonic	5 to 10 drops twice a day
Iron tincture, muriate of; tonic	10 to 30 drops
Irish moss, infusion of; nutritive, demulcent and expectorant	tablespoonful
Ipecac, powdered; emetic and diaphoretic	20 grains
Ipecac, fluid extract of; emetic and diaphoretic	20 to 25 drops
Ipecac, wine of; emetic and diaphoretic	1 to 2 teaspoonfuls
Ipecac, syrup of; emetic and diaphoretic	teaspoonful repeated
Jalap, powdered; cathartic	15 to 30 grains
Juniper berries, infusion of; diuretic	wineglassful 3 or 4 times a day
Lactucarium; anodyne	5 to 10 grains
Lady's-slipper root, decoction of; nervine	tablespoonful
Laudanum; narcotic	5 to 20 drops
Lead, acetate (sugar) of; astringent and sedative	1 to 3 grains every 3 or 4 hours
Lead, Goulard's extract of; anodyne and sedative	1 ounce diluted with 1 pint of water; applied externally to reduce inflammation.
Licorice root, decoction of; demulcent and expectorant	wineglassful
Life-everlasting, decoction of; astringent, diaphoretic, stomachic	1 to 2 tablespoonfuls
Liverwort, decoction of; astringent, demulcent and pectoral	1 to 2 tablespoonfuls
Lobelia herb, infusion of; emetic and diaphoretic	2 teaspoonfuls
Lobelia herb, powdered; emetic and diaphoretic	10 to 15 grains
Lobelia seed, tincture of; diaphoretic, emetic and expectorant	20 to 40 drops
Magnesia, carbonate; antacid and laxative	15 to 60 grains
Magnesia, calcined; antacid and laxative	15 to 60 grains
May-apple root, powdered; cathartic, hydragogue and emetic	15 to 20 grains at bed-time
May-apple root, fluid extract of; hydragogue, cathartic and emetic	15 to 30 drops at bed-time.
Manna; laxative	1 to 2 drachms before breakfast
Manna, syrup of; laxative	1 to 2 tablespoonfuls before breakfast
Mercury with chalk; alterative	2 to 10 grains
Mercury, mass of (blue pill); cathartic	3 to 10 grains
Mercury, red precipitate ointment; stimulant	applied externally
Mercurial ointment (blue); resolvent, antiparasitic	applied externally
Morphine, sulphate of; anodyne and soporific	⅛ to ¼ grain
Mustard seed (black), ground; diuretic, emetic and stimulant	½ to 1 teaspoonful
Mustard seed (white), ground; diuretic, emetic and stimulant	wineglassful
Nitrate of silver (crystals); astringent, antispasmodic	1-6 to ¼ grain 2 or 3 times a day
Nitrate of silver, lunar caustic (sticks); escharotic	applied externally
Nut-galls, tincture of; astringent	1 to 2 teaspoonfuls
Nut-galls, ointment of; astringent	1 to 2 teaspoonfuls
Nox vomica, tincture of; diuretic, excrement, stimulant and tonic	15 drops 3 times a day.
Nox vomica, fluid extract of; diuretic, excrement, stimulant and tonic	1 to 5 drops 2 or 3 times a day.
Opium, powdered; narcotic and stimulant	1 grain at bed-time
Opium, tincture of. (See Laudanum.)	
Opium, camphorated tincture of. (See Paregoric.)	
Paregoric; anodyne	1 to 2 teaspoonfuls
Pennyroyal, infusion of; diaphoretic, emmenagogue, stimulant	wineglassful every hour
Peppermint, infusion of; stimulant and carminative	wineglassful 2 or 3 times a day
Peruvian bark, powdered; febrifuge and tonic	1 drachm 2 or 3 times a day
Peruvian bark, decoction of; febrifuge and tonic	wineglassful 3 or 4 times a day
Peruvian bark, fluid extract of; tonic and febrifuge	30 to 60 drops 3 times a day

MEDICINES AND PROPERTIES.	DOSES.
Pepsin, pure; digestant	15 to 60 grains
Pepsin, saccharated; digestant	30 grains to ½ ounce
Pepsin, liquor; digestant	2 to 4 teaspoonfuls
Phenacetine; antipyretic, antineuralgic	2 to 5 grains
Pinkroot, infusion of; anthelmintic	tablespoonful before meals
Pinkroot, fluid extract of; anthelmintic	½ to 1 teaspoonful before meals
Pinkroot and senna, fluid extract of; anthelmintic, purgative	teaspoonful before meals
Podophyllin (active principle of mandrake); diuretic, purgative	1 to 3 grains at bed-time
Potash, chlorate	10 to 15 grains dissolved in water
Potash, citrate; refrigerant and diaphoretic	20 to 25 grains
Potash, nitrate (saltpetre); refrigerant and diaphoretic	6 to 12 grains
Potassium, bromide of; antiscorbutic, nerve sedative	5 to 60 grains
Potassium, iodide of; alterative and antisyphilitic	5 to 15 grains 3 times a day
Rochelle salts; aperient	2 or 3 drachms before breakfast
Rhatany root, decoction of; astringent and tonic	tablespoonful
Rhatany root, tincture of; astringent and tonic	teaspoonful
Rhubarb, powdered; astringent and cathartic	20 to 30 grains
Rhubarb, tincture of; astringent and cathartic	1 to 2 teaspoonfuls
Rhubarb, fluid extract of; cathartic and astringent	25 to 40 drops
Rhubarb, syrup of; cathartic and astringent	2 or 3 teaspoonfuls
Rue herb, decoction of; tonic, anthelmintic and emmenagogue	tablespoonful
Saffron (American), infusion of; diaphoretic	2 to 3 teaspoonfuls
Saffron (Spanish), infusion of; diaphoretic	1 to 2 teaspoonfuls
Sage, infusion of; sudorific and stomachic	wineglassful
Sassafras pith, infusion of; demulcent and anodyne	1 or 2 teaspoonfuls; also applied to sore eyes.
Sassafras bark, infusion of; diaphoretic and stimulant	wineglassful every 2 or 3 hours
Sarsaparilla, decoction of; alterative and deobstruent	teacupful 3 times a day
Sarsaparilla, fluid extract of; alterative and deobstruent	teaspoonful 3 times a day
Sarsaparilla, compound syrup of; alterative, deobstruent	tablespoonful 4 to 6 times a day
Scammony; cathartic	5 to 15 grains at bed-time
Senega (snakeroot), fluid extract of; expectorant, stimulant and diuretic	5 to 20 drops
Senna, decoction of; cathartic	1 to 2 tablespoonfuls
Senna, fluid extract of; cathartic	1 to 4 teaspoonfuls
Stramonium leaves, tincture of; narcotic, sedative, antispasmodic	10 to 20 drops 2 or 3 times a day.
Stramonium leaves, ointment of; sedative	applied externally
Soda, bicarbonate; antacid	15 to 30 grains
Seidlitz powders; aperient	1 powder before breakfast
Sweet spirits of nitre; diaphoretic, diuretic and febrifuge	30 to 60 drops
Tansy (double), decoction of; sudorific, emmenagogue, anthelmintic	1 to 2 tablespoonfuls
Thyme, infusion of; aromatic and stomachic	wineglassful
Uva ursa leaves, decoction of; diuretic and tonic	wineglassful 3 or 4 times a day
Uva ursa, fluid extract of; diuretic and tonic	½ to 1 teaspoonful 3 or 4 times a day
Waterpepper herb, tincture of; stimulant, diuretic and emmenagogue	teaspoonful
Wild cherry bark, cold infusion of; tonic, astringent, sedative	tablespoonful 3 times a day.
Wild cherry bark, syrup of; sedative	tablespoonful 3 times a day
Witch-hazel; anodyne, astringent, sedative, styptic	1 to 2 teaspoonfuls; also, externally to reduce inflammation.

INSTRUCTIVE TABLES UPON HYGIENIC SUBJECTS.

EXPECTATION OF LIFE AT VARIOUS AGES.

Age.	*Male.*	*Fem.*	*Age.*	*Male.*	*Fem.*	*Age.*	*Male.*	*Fem.*	*Age.*	*Male.*	*Fem.*
0 year	39.91	41.85	25 years	36.12	37.04	50 years	19.54	20.75	75 years	6.49	6.93
1 year	46.65	47.31	26 years	35.44	36.39	51 years	18.90	20.09	76 years	6.15	6.56
2 years	48.83	49.40	27 years	34.77	35.75	52 years	18.28	19.42	77 years	5.82	6.21
3 years	49.61	50.20	28 years	34.10	35.10	53 years	17.67	18.75	78 years	5.51	5.88
4 years	49.81	50.43	29 years	33.43	34.46	54 years	17.06	18.08	79 years	5.21	5.56
5 years	49.71	50.33	30 years	32.76	33.81	55 years	16.45	17.43	80 years	4.93	5.26
6 years	49.39	50.00	31 years	32.09	33.17	56 years	15.86	16.79	81 years	4,66	4 98
7 years	48.92	49.53	32 years	31.42	32.53	57 years	15.26	16.17	82 years	4.41	4 71
8 years	48.37	48.98	33 years	30.74	31.88	58 years	14.68	15.55	83 years	4.17	4.45
9 years	47.74	48.35	34 years	30.07	31.23	59 years	14.10	14.94	84 years	3.95	4.21
10 years	47.05	47.67	35 years	29.40	30.59	60 years	13.53	14,34	85 years	3.73	3.98
11 years	46.31	46.95	36 years	28.73	29 94	61 years	12.96	13.75	86 years	3.53	3.76
12 years	45.54	46.20	37 years	28.06	29.29	62 years	12.41	13.17	87 years	3.34	3.56
13 years	44 76	45.44	38 years	27.39	28.64	63 years	11.87	12.60	88 years	3.16	3.36
14 years	43.97	44.68	39 years	26 72	27.99	64 years	11.34	12.05	89 years	3.00	3.18
15 years	43.18	43.90	40 years	26.06	27.34	65 years	10.82	11.51	90 years	2.84	3.01
16 years	42.40	43.14	41 years	25.39	26.69	66 years	10.32	10.98	91 years	2 69	2.85
17 years	41.64	42.40	42 years	24.73	26.03	67 years	9.83	10.47	92 years	2.55	2.70
18 years	40.90	41.67	43 years	24.07	25.38	68 years	9.36	9.97	93 years	2.41	2 55
19 years	40.17	40.97	44 years	23.41	24.72	69 years	8.90	9.48	94 years	2.29	2.42
20 years	39.48	40.29	45 years	22.76	24.06	70 years	8.45	9.02	95 years	2.17	2 29
21 years	38.80	39.63	46 years	22.11	23.40	71 years	8.03	8.57	96 years	2.06	2 17
22 years	38.13	38.98	47 years	21.46	22.74	72 years	7.62	8.13	97 years	1.95	2.06
23 years	37.46	38.33	48 years	20.82	22.08	73 years	7.22	7.71	98 years	1.85	1.96
24 years	36.79	37.68	49 years	20.17	21.42	74 years	6.85	7.31	99 years	1.76	1.86
									100 years	1.68	1.76

TABLE SHOWING THE DEATH-RATE PER 1,000 OF EACH SEX IN EACH OF THE THREE CONDITIONS OF LIFE.

AGES.	MALES.			FEMALES.		
	Unmarried.	*Married.*	*Widowers.*	*Unmarried.*	*Married.*	*Widows.*
20–25...	12.88	8.92	49.60	8.32	9.92	12.31
25–30...	10.17	6.24	21.84	9.02	8.98	23.62
30–35...	11.51	6.82	19.17	9.87	9.36	16.90
35–40...	13.15	7.52	17.50	10.87	9.29	15.03
40-45...	16.62	9.55	18.89	13.28	10.14	12.73
45–50...	19.60	11.47	22.20	15.71	10.69	13.30
50–55...	25.80	15.61	26.80	20.97	14.11	15.20
55–60.	32.10	21.50	34.17	26.90	19.29	24.47
60–65...	45.92	32 60	47.50	40.52	30.75	37.07
65–70...	58.50	44 80	62.97	58.30	45.30	53.50

BIRTH, MARRIAGE, AND DEATH STATISTICS.

The following interesting table gives a comparative view of the fertility of marriages, the legitimacy and illegitimacy of births, and the mortality in city and country in the various European States:

COUNTRIES.	CHILDREN TO ONE MARRIAGE.		INFANT MORTALITY.		ADULT MORTALITY.		FERTILITY OF MARRIAGE.		ILLEGITIMATE TO LEGITIMATE BIRTHS.	
	City.	*Country.*	*City.*	*Country.*	*City.*	*Country.*	*City.*	*Country.*	*City.*	*Country*
France......	3.16	3.28	*35.69	*28.56	1 : 21.51	1 : 42.21	2 03	2 34	*15 13	*4.24
Netherlands..	3.91	4.32	36.25	28.90	1 : 35.55	1 : 43.03	2.49	3.07	7.7	2.84
Belgium.....	3.80	4.17			1 : 34 35	1 : 44.31			14.59	5.88
Sweden......	2.99	4.19	38.86	24.50	1 : 28.95	1 : 46.86	1.83	3.16	27.44	7.50
Denmark....	3.04	3.34	29.66	22.68	1 : 37.41	1 : 49.77	2.14	2.58	16.45	10.06
Schleswig...	3.50	3 69	27.42	23.42	1 : 35.17	1 : 48.49	2.54	2.83	8.38	6 37
Holstein.....	3.37	3.88	29.92	25.29	1 : 38.73	1 : 44.15	2.36	2.90	15 50	8.74
Saxony.....	4.60	4.18	39.88	36 22	1 : 31.10	1 : 34.70	2.77	2.64	15.39	14.64
Hanover....	2.93	3.65	28.70	26.47	1 : 38.52	1 : 41.17	2.08	2 68	17.42	9.06
Prussia......	4.00	4.44	36.02	29.47	1 : 27.97	1 : 34.46	2.56	3.13	9 80	6.60

*Per cent.

AVERAGE LENGTH OF LIFE IN VARIOUS OCCUPATIONS.

The Report of Registration of the State of Massachusetts shows that the average length of life of the various trades and professions has been as follows:

Occupations.	*Years.*	*Occupations.*	*Years.*
Farmers	65.19	Weavers	44.65
Millers	57.43	Artists	44.56
Sawyers	56.67	Shoemakers	44.45
Physicians	55.08	Brushmakers	43 40
Hatters	54.55	Furnace Men	43.05
Clock and Watchmakers	54.43	Founders	42.73
Carpenters and Joiners	53.31	Shoecutters	42.62
Blacksmiths	53.31	Pianofortemakers	42.50
Sailmakers	52.84	Glasscutters	42.39
Woodturners	52.55	Civil Engineers	42.34
Combmakers	51.38	Cigarmakers	41.59
Masons	50.48	Engineers	41.57
Butchers	50.29	Musicians	41.19
Tanners	50.05	Tinsmiths	40 96
Cabinetmakers	48.65	Expressmen	40.94
Gunsmiths	48.57	Nailmakers	40.80
Carriagemakers	48.38	Machinists	40.80
Harnessmakers	48.36	Jewelers	40.29
Brickmakers	47.99	Servants (women)	40.19
Woolsorters	47.55	Teamsters	40.13
Leatherdressers	47.41	Bookbinders	39 94
Laborers	47.39	Upholsterers	39.78
Musical Instrument Makers	47.32	Barbers	39 77
Tailors	47.19	Pail and Tubmakers	39.50
Architects	47.15	Cutlers	39.23
Bakers	46.76	Operatives	38.92
Dressmakers (women)	46.49	Printers	38.57
Seamen	46.33	Engineers and Firemen	38.21
Stonecutters	46.30	Drivers	38.16
Coppersmiths	46.07	Milliners	37.30
Silver and Goldsmiths	45.46	Glassblowers	37.81
Dyers	45 35	Plumbers	35.43
Mechanics	45.13	Carvers	33.84
Painters	45.05	Operatives (women)	27.98

AVERAGE WEIGHT AND STATURE OF MAN.

MALES.			FEMALES.		
Age.	*Feet.*	*Pounds.*	*Age.*	*Feet.*	*Pounds.*
0 years	1.64	7.06	0 years	1.62	6.42
2 years	2.60	25.01	2 years	2 56	23.53
4 years	3.04	31.38	4 years	3 00	28.67
6 years	3.44	38.80	6 years	3.38	35.29
9 years	4.00	49.95	9 years	3.92	47.10
11 years	4.36	49.77	11 years	4.26	56.57
13 years	4.72	75.81	13 years	4.60	72.65
15 years	5.07	96.40	15 years	4.92	89.04
17 years	5.36	116.56	17 years	5 10	104.34
18 years	5.44	127.59	18 years	5.13	112.55
20 years	5.49	132.46	20 years	5.16	115.30
30 years	5.52	140.38	30 years	5.18	119.82
40 years	5.52	140.42	40 years	5.18	121.81
50 years	5.49	139.96	50 years	5.04	123.86
60 years	5.38	136.07	60 years	4.97	119.76
70 years	5.32	131.27	70 years	4.97	113.60
80 years	5.29	127.54	80 years	4.94	108.80
90 years	5.29	127.54	90 years	4.94	108.81

COMPOSITION OF THE HUMAN BODY.

ELEMENTS.	*Pounds.*	*Ounces.*	*Grains.*
1. Water, which is found in every part of the body, and amounts to.	109	0	0
2. Fibrine, and like substances, found in the blood, and forming the chief solid materials of the flesh	15	10	0
3. Phosphate of lime, chiefly in bones and teeth, but in all liquids and tissues	8	12	0
4. Fat, a mixture of three chemical compounds, and distributed all through the body	4	8	0
5. Osseine, the organic framework of bones; boiled, gives gelatine. Weighs	4	7	350
6. Keratine, a nitrogenous substance, forming the greater part of hair, nails and skin. Weighs	4	2	0
7. Cartilagine resembles the osseine or bone, and is a nitrogenous substance, the chief constituent of cartilage, weighing	1	8	0
8. Hemoglobine gives the red color to the blood, and is a nitrogenous substance containing iron, and weighing	1	8	0
9. Albumen is a soluble nitrogenous substance found in the blood, chyle, lymph and muscle, and weighs	1	1	0
10. Carbonate of lime is found in the bones chiefly, and weighs	1	1	0
11. Kephalin is found in nerves and brain, with cerebrine and other compounds	0	13	0
12. Fluoride of calcium is found in teeth and bones, and weighs	0	7	175
13. Phosphate of magnesia is also in teeth and bones, and weighs	0	7	0
14. Chloride of sodium, or common salt, is found in all parts of the body, and weighs	0	7	0
15. Cholesterin, glycogen and inosite are compounds containing hydrogen, oxygen and carbon, found in muscle, liver and brain, and weighing	0	3	0
16. Sulphate, phosphate and salts of sodium, found in all tissues and liquids	0	2	107
17. Sulphate, phosphates and chloride of potassium are also in all tissues and liquids	0	0	300
18. Silica, found in hair, skin and bone	0	0	30
	154	0	0

PERCENTAGE OF NUTRITION IN VARIOUS ARTICLES OF FOOD.

Raw Cucumbers	2
Raw Melons	3
Boiled Turnips	4½
Milk	7
Cabbage	7½
Currants	10
Whipped Eggs	13
Beets	14
Apples	16
Peaches	20
Boiled Codfish	21
Broiled Venison	22
Potatoes	22½
Fried Veal	24
Roast Pork	24
Roast Poultry	26
Raw Beef	26
Raw Grapes	27
Raw Plums	29
Broiled Mutton	30
Oatmeal Porridge	75
Rye Bread	79
Boiled Beans	87
Boiled Rice	88
Barley Bread	88
Wheat Bread	90
Baked Corn Bread	91
Boiled Barley	92
Butter	92
Boiled Peas	93
Raw Oils	95

WARMTH AND STRENGTH DERIVED FROM VARIOUS ARTICLES OF FOOD AND DRINK.

Grains of Strength yielded by one pound of 7,000 grains.	*Grains.*
Beer or Porter	1
Parsnips	12
Turnips	12
Whey	13
Greens	14
Potatoes	24
Skimmed Milk	34
New Milk	35
Buttermilk	35
Barley	70
Rice	70
Bacon	78
Rye Bread	89
Baker's Bread	90
Pearl Barley	91
Fresh Pork	108
Seconds Flour	120
Corn Meal	125
Fresh Fish	129
Cocoa	130
Oatmeal	140
Mutton	140
Fresh Beef	172
Beef Liver	200
Split Peas	250
Cheddar Cheese	310
Skim Milk Cheese	360

Grains of Warmth yielded by one pound of 7,000 grains.	*Grains.*
Whey	150
Turnips	238
Beer and Porter	315
Buttermilk	335
Skimmed Milk	351
New Milk	378
Carrots	390
Parsnips	425
Potatoes	770
Fresh Fish	980
Beef Liver	1,220
Red Herrings	1,455
Baker's Bread	1,990
Fresh Beef	2,300
Molasses	2,300
Skim Milk Cheese	2,350
Cheddar Cheese	2,550
Seconds Flour	2,700
Rye Bread	2,700
Rice	2,750
Barley Meal	2,780
Indian Meal	2,800
Sugar	2,900
Fresh Pork	3,100
Bacon	4,200
Butter	4,700
Lard	4,800
Drippings	5,500

THE HOME ADMINISTRATION OF MEDICINES.

Some Clear Facts.—To the careful reader of the foregoing pages, three important facts must be clear: (first) that very many of the ailments of life may be entirely avoided without the use of medicine; (second) that very many important things may be done for the relief and cure of disease by home treatment while waiting for a doctor; (third) that in a very large majority of cases a doctor will not be needed at all if the instructions given in this volume are faithfully and intelligently carried out.

Home Medicine.—In the home administration of medicine there are three essentials, viz.: promptness, accuracy, a proper judgment of symptoms and a correct fitting of the dose to the needs of the patient. No remedy should be given unless there is a distinct indication for its use. In order to facilitate prompt action and insure accuracy, we give here a list of medicines which should be kept on hand by every family, formulas for prescriptions for all the more common ailments, with directions for use, and a short treatise on symptoms.

Use of This Department.—This department is intended to supplement the preceding sections, and in connection with the hygienic and general treatment elsewhere set forth, it will render every possessor of this modern family work measurably independent of doctors, and will save nine-tenths of the doctors' bills. At the same time it must be borne in mind that the services of a competent physician are sometimes indispensable; that our best reliance is upon hygienic prevention; that it is highly dangerous for non-professionals to attempt to use any other than simple remedies, and that, on general principles, the less medicine taken the better for the patient.

SYMPTOMS AND INDICATIONS OF DISEASE.

In this chapter we give only an outline of the more distinct and prominent general symptoms of disease, as shown by the tongue, pulse, temperature, and so forth. No man is infallible when it comes to a diagnosis. The most learned physicians, who have had years of study and experience, often find themselves puzzled to interpret the existence of certain symptoms and to decide the nature of the disease before them. A general knowledge of symptoms, however, is useful to everybody, and this we give here. The special symptoms of each individual disease will be found in previous pages, under appropriate headings.

The Tongue.—If bright red on edges and end a stomach difficulty is indicated. If, in addition, it is dry and parched, the condition is serious.

A red "strawberry" tongue indicates scarlet fever. If simply red, measles and inflammation of stomach and bowels.

A pale tongue indicates debility, and if impressions from the teeth are shown, great prostration is indicated.

A thick coating on tongue indicates severe disease. A thin coating indicates a less severe trouble.

A furred tongue indicates disease of liver and stomach, fever and indigestion.

A thick, brown or black coating on the tongue, with cracks and fissures, is seen in typhoid and other low fevers.

Difficulty in protruding the tongue and trembling of that member are unfavorable indications.

Rapid cleaning of the tongue and cleaning in spots, are not indications of recovery, and are unfavorable symptoms.

The Pulse.—A normal pulse, as felt at the wrist, near the base of the thumb, is full, elastic and regular; the average normal rate of pulsations is 70 beats per minute in male adults, 75 in females; from 75 to 90 in youthful persons, from 90 to 100 in childhood, and from 100 to 120 in infancy. The pulse rate in old age is from 80 to 85 per minute. Sudden fright, exertion, excitement or emotion will quicken the pulse. But, if no disease exists, it will soon regain its accustomed rate. The recumbent posture causes a lowering of the pulse of about eight or more beats per minute.

A full and frequent pulse, say from 100 to 110 per minute, indicates fever.

A bounding pulse, 110 to 125 per minute, indicates high fever and inflammation. If home treatment fails to reduce this pulse with reasonable rapidity, call a physician at once.

A soft, frequent pulse, say 100 to 120 per minute, indicates advanced continued fever, with debility.

A wiry, frequent pulse, hard and not easily compressed, indicates fever with inflammation, and shows that the disease is of a serious character.

A weak, intermitting pulse, or a thin, thread-like pulse, with or without short intermissions of rest, indicates extreme prostration preceding death, or may occur as a result of hemorrhage or during a fainting fit. In such cases active stimulants must be promptly and energetically used. An intermitting pulse occurs in certain forms of heart disease, when the general health seems good.

Temperature.—One of the most needful articles for the sick room is the "clinical thermometer," such as is now used by all progressive physicians. It consists of a glass tube, with a bulb filled with quicksilver on one end—very similar to the ordinary thermometer tube, and is inexpensive. The use of the clinical thermometer represents the most useful discovery in medical science since the time of the great Harvey. In order to ascertain the temperature of the blood, place the bulb of the thermometer in the mouth or under the arms. The temperature of a patient should be taken as regularly as the pulse, three or four times a day, at least, and a regular daily record of both pulse and temperature is of the greatest importance and assistance to the nurse or doctor.

Normal Temperature.—The normal blood heat of adults is 98½ degrees Fahrenheit. This degree of heat is quite steadily maintained by grown people in fair health. The temperature normally is one degree higher under the tongue than under the arm. It is highest upon awakening in the morning; lowest at midnight. A rise of one degree in temperature usually marks an increase of the pulse from six to ten beats per minute.

Temperature of Children.—In children the temperature is normally one to two degrees higher than in adults. Children and infants lose their normal heat much more easily and rapidly than adults, and the excessive mortality during the first year of infancy may be largely ascribed to the neglect of parents and nurses to keep up the normal temperature of the infants under their charge. It is an established fact that neglect to use the clinical thermometer and to provide proper clothing to guard against the sudden changes in blood heat causes the death of thousands of infants annually. Be sure to have a reliable clinical thermometer in your home medicine chest.

High Temperature.—A heat of 100 degrees to 102 degrees indicates slight fever, 104 degrees indicates high fever, 106 degrees means great danger, and 107 degrees to 108 degrees usually indicates a fatal termination. Aconite and sweet spirits of nitre, internally, reduce fever. Mustard plasters, stimulating liniments and alcohol, applied externally, tend to decrease the temperature.

Low Temperature.—A temperature (in adults) below 96 degrees indicates a condition of collapse, and if below 92 degrees fatal results are almost inevitable. In cases of paralysis, the affected part is colder than the rest of the body. Active stimulation with brandy, etc., chafing the limbs and dry heat are useful in restoring warmth.

Temperature in Sickness.—The pulse does not always indicate the degree of heat or fever. A high temperature (102 degrees to 105 degrees), with a slow pulse, indicates disease of the brain or spine. In smallpox the temperature will average 104 degrees, and at the crisis of the fever 106 degrees. In measles the average temperature in favorable cases is 102 degrees to 103 degrees; in typhoid fever the usual temperature is 103 degrees to 104 degrees, and if it rises to 106 degrees or 107 degrees it is generally fatal. In fevers a sudden fall indicates a crisis, and if the fall is of several degrees great danger is to be apprehended. In the application of cold water to allay fevers, be careful not to reduce the temperature too rapidly. (See Scarlet Fever.) If the temperature of a patient (adult) rises to 102 degrees or 103 degrees and continues there (particularly if the respiration exceeds 20 breaths per minute and the pulsation is much above 100 per minute), call a physician without delay.

Respiration.—In health the average adult breathes from 17 to 20 times a minute.

Two months to two years	35	per	minute
Two to six years	23	"	"
Six to twelve years	20	"	"
Twelve to fifteen years	18	"	"
Fifteen to twenty-one years	16 to 18	"	"

Respiration in the adult female is usually a trifle faster than in the male, especially during pregnancy. The respirations are regular, and involve the muscles of both chest and abdomen.

Diseases Indicated by Muscle Movements.—When the chest muscles alone are used, inflammation of the bowels is indicated. When the abdominal muscles are chiefly used, some difficulty in the chest—possibly pleurisy—is indicated.

When respiration is attended by a sharp, cutting pain or "catch" in side of chest, pleurisy is indicated; but the trouble may be neuralgia or rheumatism of the muscles.

Difficult Breathing.—Difficulty in breathing may arise from the mechanical obstruction of pneumonia, asthma, croup, bronchitis, dropsy, and so forth, or may be owing to great debility, nervous prostration, bad air, certain forms of heart disease, and so forth.

A heavy, semi-snoring respiration occurs in apoplexy, opium poisoning, fracture of skull and drunkenness.

Pain.—Pain is not always at the seat of the disease which causes it. In ovarian diseases it is often in the limbs, and in diseases of the womb it is often located in the top of the head or shoulders; in diseases of the liver, pain is felt under the shoulder-blade; in diseases of the hip, the pain appears at the knee; in neuralgia, the pain is darting, cutting, shooting and occasionally dull and hard to locate; in rheumatism it is intense and tearing; in pleurisy it is acute, with a "catch;" in pneumonia it is aching and heavy; in erysipelas it is burning; in dysentery it is griping. When an abscess is forming the pain is throbbing; in cancer it is cutting and pricking.

Pain Symptoms of Diseases.—When pain affects a certain side of the head, or a certain limited area of surface, it is generally neuralgia. Heavy, dull pain in lower part of the head, and chills running up and down the spine, are early symptoms of typhoid fever. Pain in the lower spinal region is a symptom of small-pox, if the intensity of the pain is not affected by bending or moving the part; if increased thereby, lumbago or rheumatism is indicated.

Vomiting.—This indicates the presence of improper or undigested matter in the stomach; when this is removed, the vomiting should be checked—not before, as a rule. Vomiting may also be caused by inflammation of stomach, deranged liver, pregnancy, etc. Vomiting blood from the stomach indicates cancer, or severe ulceration; it may result from an injury.

Purging.—Generally speaking, the appearance of diarrhœa indicates that the bowels are trying to rid themselves of some irritating substance. Nature should be assisted, therefore, by a gentle laxative, and after the offending matter is removed the diarrhœa will either cease of itself, or will have to be checked by medication. This should be done gradually.

Expectoration.—In pneumonia the expectoration is rusty looking—later it becomes purplish; in catarrh it is mucus; in consumption it consists of mucous clots streaked with blood, frothy mucus, and in later stages a purulent, and often very offensive and slimy phlegm.

Urine.—Scanty urine, or complete suppression of urine, may be caused by disease of the bladder or kidneys, or stone in bladder, and if long continued, is a very dangerous symptom. Frequent desire to pass water occurs in diabetes, and the flow is profuse. Hysteria, inflammation of the bladder and kidneys, and stone in the bladder are accompanied by frequent desire to urinate, with scanty discharges.

The Skin.—The skin is yellow in jaundice, yellow fever and bilious attacks; purplish in low, continued fevers; blue in bad cases of cholera, collapse, and so forth; flushed in congestion of the brain and most fevers; pale in fainting fits or anemia. The bright red, hectic flush on upper part of cheeks indicates consumption. Moisture of the skin denotes health. During fever the skin is hot and dry; it is a favorable sign when pulse and temperature are reduced and skin becomes moist.

The Skin Signs of Diseases.—Hot and cold alternately in the entire skin or a part of it indicates nervous depression.

Peculiarly thin and easily raised from the subcutaneous tissue in consumption and wasting diseases.

Pallor is due to defective filling of the capillaries, due to indigestion, anemia. Perspiration is sour in rheumatism, also in diseases attendant on mal-assimilation. An excessive perspiration of any kind may be accompanied by small blisters on the skin (sudamina).

Profuse drenching from sweat indicates great debility or exhaustion, as in lung-consumption.

A rigor or chill indicates nervous depression, and either foreshadows a fever or formation of an abscess. Rigor, with "goose-skin," denotes malaria.

Distention of the Abdomen.—This occurs in colic, in which case kneading or pressing with the hands occasions no pain; in inflammation of the bowels, peritonitis and mesenteric disease, in which cases the mere touch of the hand is painful; also in dropsy and enlargement of the liver. In the latter case there is not much pain, as a rule, but a feeling of great discomfort.

Pain in the Chest.—This may indicate some congestion of the lungs or pleura, or maybe neuralgia or rheumatism of the external muscles. If directly under the breast bone it may be heartburn, caused by dyspepsia. If the cause is neuralgia, the pain is generally located on one side, and may extend around to the back. Many people suppose themselves to be far gone with consumption when their whole trouble is due to neuralgia of the muscles. The pain in such cases sometimes resembles very closely the "catch" of pleurisy, but is without the feverish symptoms that attend pleurisy.

Unfavorable Indications.—In cases of protracted disease, picking at the bed clothes is a sign of approaching death. In low fevers, such as typhoid, the accumulation of mucus, called sordes, on the teeth and lips is a very unfavorable symptom. Low, incoherent mumbling, with prostration, is a very unfavorable sign, frequently seen in prolonged cases of low fevers.

THE WEIGHT OF THE BODY.

The average weight of the body at birth is about seven and one-half pounds. We meet with cases frequently over twelve pounds and as low as two pounds in living children. But when the average male completes his twenty-fifth year of his age growth has reached its maximum, but not weight. The general weight consistent with good health and stature should be as follows:

Stature.	*Mean Weight, Pounds.*	*Weight Increased 7 per cent. Pounds.*
5 ft. 1 in.	120	128
5 " 2 "	126	135
5 " 3 "	133	142
5 " 4 "	139	149
5 " 5 "	142	152
5 " 6 "	145	155
5 " 7 "	148	158
5 " 8 "	155	166
5 " 9 "	162	173
5 "10 "	169	181
5 "11 "	174	186
6 "—	178	190

Effects of Weight.—If greater than the allowed 7 per cent., it affects the vital capacity, and respiration becomes diminished.

Clothes average about one-eighteenth of the weight of the body in autumn and early spring. Loss of weight is indicative of phthisis, bronchitis, nervous dyspepsia and other wasting diseases.

HOME REMEDIES, PRESCRIPTIONS AND RECIPES.

HEADACHE.

This is generally a symptom of some other disorder, and can be relieved only by curing the primary trouble. There are five distinct kinds of headache, which may be described as follows:

Sick Headache.—This is caused by some derangement of the stomach and liver and is apt to occur more or less regularly at intervals of two or four weeks. It is a most distressing form of the malady. The pain is often confined to the temples, or is most severe there; occasionally the back of the head seems most affected. There is really no trouble in the head; it is all in the digestive tract. The following method of treatment will usually cure:

Treatment.—Soak the feet in hot water containing a handful of either mustard or salt; at the same time give an emetic, such as two teaspoonfuls of wine of ipecac; or an infusion of lobelia (made by steeping two teaspoonfuls of the powdered leaves for twenty minutes in a half-pint of boiling water). Before taking this emetic, it is well to drink a half-pint or pint of some warm tea, like sage or pennyroyal. When free vomiting has occurred, give patient a little gruel and let him rest in bed for two or three hours. Then give an active cathartic.

Auxiliary Treatment.—Keep the bowels open by giving one or two of these pills every night for several days. Bathing the whole body with weak saleratus water often affords relief, in conjunction with this treatment; also applications of cold water to the head when the heat is intense.

Nervous Headache.—This form of headache denotes a weak, debilitated condition of the nervous system, caused by long-continued illness, loss of blood, unwonted mental excitement, etc. There is more or less stupidity and confusion of ideas, sometimes dimness of vision, and a dull pain in the head.

Treatment.—**1.** The treatment is directed to toning up the system. Have the following prescription prepared by an apothecary:

Extract of valerian	15 grains
Sulphate quinine	10 grains
Extract hyoscyamus	15 grains
Cayenne pepper	5 grains

Make into 15 pills and take one pill three times a day.

2. In addition to this, it is advisable to get:

Tincture of blood-root	1 ounce
Muriated tincture of iron	1 ounce

Mix. Take ten drops in a gill of water three times a day. This adds tone and strength to the blood.

Rheumatic and Sympathetic Headache.—In cases of fever of any kind the heated blood passing through the brain gives rise to pains in the head that may be relieved somewhat by the application of cold water or cracked ice, but cannot be cured without removing the primary trouble. Disease of the kidneys gives rise to headache, caused by insufficient elimination of the uric acid; women often suffer from headache during pregnancy.

Treatment.—These forms of the malady can only be relieved by cooling the head, as above directed. When a person is suffering from rheumatism, it sometimes seems as if the pain jumps from the affected part to the head and back again at intervals. In such cases the employment of remedies for the original trouble is required.

Chronic Headache.—Sometimes there appears a chronic form of headache, originating, perhaps, in some severe spell of sickness and persisting in spite of all remedies. This form is likely to affect some one part of the head, and whilst it may vary in intensity, is seldom entirely absent.

Treatment.—The treatment consists of laxative medicines to keep the bowels always free, but without violent purging. Keep the feet warm and the circulation equalized. Diet must be plain and nourishing. A certain form of chronic headache sometimes accompanies catarrh, and is relieved only by curing the catarrh. As a good general rule—keep the feet warm, the head cool, the skin clean and the bowels open.

Plethoric Headache.—This type of headache most affects persons of full habit, and is caused by too great flow of blood to the brain. It can easily be recognized; stooping down and then raising the head gives a sense of fullness and pain; suddenly jarring or shaking the head aggravates the pain; blowing or straining, or pressure on the neck gives rise to pain, with more or less giddiness. Sometimes the excess of blood in the brain indicates an over-supply all through the body; in other cases it is caused by a derangement of the circulation, other parts of the body suffering from an insufficient amount of blood. In the latter case the extremities will be cold, while the head is flushed and hot, with severe throbbing sensations.

Treatment.—In such cases the feet and legs must be soaked in hot mustard water, with a sprinkling of cayenne pepper, and thoroughly rubbed with a coarse towel. Give an active hydragogue cathartic (see pill recommended under Pleurisy), repeat every three day , if necessary, until complete relief is obtained.

Diet.—Diet should be light and unstimulating—fruits, oatmeal porridge, etc.

COLD IN THE HEAD—NASAL CATARRH.

This common complaint will frequently run its course and disappear in four or five days, but may be cut short by care and simple remedies.

Treatment.—In the first place take a saline purgative, such as a dose of Epsom salts—or a seidlitz powder. At bedtime soak the feet in hot mustard water and take ten grains of Dover's powder. Cover up warm in bed and "sweat it out." The use of quinine—say one two-grain pill every three hours—is also useful, but not always essential.

COMMON COUGH—BRONCHIAL CATARRH.

This form of a cold may originate in the throat and chest, or may be caused by the spreading downward of unchecked nasal catarrh.

Treatment.—1. Treatment in first stages is similar to that given for nasal catarrh (preceding) or for bronchitis, with a saline purgative. If the cough becomes troublesome use:

Muriate of ammonia	1 drachm
Fluid extract of licorice	4 drachms
Syrup of wild cherry bark	1 ounce
Water	1½ ounces

Dose: A teaspoonful every two hours, according to severity of symptoms.

2. If the cough still continues after three or four days, make a cough mixture composed of:

Syrup of squills	6 drachms
Syrup of wild cherry	6 drachms
Acetate of morphia	1 grain
Cyanide of potassium	1 grain

This should be compounded by an apothecary and thoroughly mixed. Dose for adult, one teaspoonful every six hours. This mixture is very effective, but must be used with caution, as it contains ingredients which are poisonous in overdoses.

CHRONIC CATARRH.

This results from neglected or repeated attacks of the acute form, or follows measles, scarlet fever, and so forth. There is a constant offensive discharge from the nose and nasal passages, pain in the eyes and head, sneezing, loss of appetite, and so forth.

Treatment.—A snuff composed of:

Bloodroot	2 ounces
Bayberry root	1½ ounces
Peruvian bark	2 ounces
Borax, pulverized	½ ounce

finely pulverized and mixed, should be kept on hand and constantly snuffed into the nostrils. The bowels must be kept open by taking occasional simple purgatives. Strength should be kept up by the use of tonic pills as follows:

Sulphate quinine	1 grain
Citrate iron	2 grains
Strychnine	1-60 grain

Have 50 of these pills made by a good apothecary. For a tonic in general debility, nervous exhaustion, etc., take one pill after each meal.

HAY FEVER.

This strange complaint does not yield readily to any treatment, except removal to certain high localities where it is unknown—such as the White or Adirondack Mountains.

Treatment.—The best way to meet its annual onset is to fortify the system with tonics, such as quinine and iron. A pill composed of:

Quinine	2 grains
Citrate of iron	2 grains
Strychnine	1-60 grain

taken after each meal for three weeks preceding the usual time for the appearance of the disorder will sometimes prevent its development.

Accessory Treatment.—There is no certain cure or preventive so far as known. Gargling the throat with a solution of chlorate of potash will generally afford relief from the tickling sensation there, and using powdered quinine as a snuff sometimes proves beneficial.

ASTHMA.

No fixed formula can be always depended upon; for a remedy which will benefit one case will often prove useless in another.

Treatment.—1. One of the best preparations is a powder composed of:

Sulphur	3 ounces
Pulverized senna	2 ounces
Pulverized aniseed	1 ounce
Cream tartar	2 ounces

Mix, and take one teaspoonful in syrup or honey at bed-time. May also be used through the day if symptoms are urgent.

2. Another remedy, highly recommended, is thus prepared:

Lobelia leaves	1 teacupful
Hot water	1 pint

Steep one-half hour. Take one tablespoonful at a dose every fifteen to thirty minutes until free spitting of mucus is produced.

3. For very urgent cases the following is generally satisfactory, but must be used with caution:

Ether	½ teaspoonful
Laudanum	30 drops
Water	1 wineglassful

To be taken only once, or at most twice, and if second dose is given, it must not be sooner than six hours after the first dose.

BRONCHITIS.

Symptoms.—Early symptoms are those of an ordinary severe cold. The attack can generally be cut short by taking ten grains of Dover's powder at bedtime with a hot mustard foot bath.

Treatment.—1. Just before retiring take ten grains of quinine—the raw powder is best, but five two-grain sugar-coated pills will do. The following mixture makes an excellent stimulating liniment:

Oil hemlock	1	ounce
Oil origanum	½	ounce
Gum myrrh	2	ounces
Cayenne pepper	½	ounce
Gum camphor	½	ounce
Alcohol or whiskey	1	pint

Mix, shake well, and apply to chest, rubbing in thoroughly.

2. If the throat is sore use a gargle of chlorite of potash—one teaspoonful to one-half glass of water. If these remedies do not prove effective the case requires medical attendance at once.

HOARSENESS.

Treatment.—In addition to the remedies elsewhere given for coughs and colds, the following is highly recommended for hoarseness:

Fresh horseradish, grated	2	ounces
Cider vinegar	½	pint
Strained honey	1	gill

Put the horseradish into the vinegar and let it stand twelve to fifteen hours; then add the honey and heat it nearly to boiling, but do not allow it to reach the boiling point. Strain and squeeze out the liquid and bottle for use. An adult can take a teaspoonful or more, four times a day, or oftener, until relief is obtained.

WHOOPING-COUGH.

Treatment.—1. Keep the bowels open with castor oil, or the following mixture:

Castor oil	2	ounces
Molasses	4	ounces

Mix well and give a tablespoonful once or twice a day.

2. To relieve the paroxysms of coughing have the following prepared by an apothecary:

Extract belladonna	10 grains
Powdered alum	1 drachm
Alcohol	4 drachms
Simple syrup	4 ounces

Give one teaspoonful of the mixture every four or five hours, or every three hours if the fits of coughing are very severe.

3. Or take:

Dilute nitric acid	1 drachm
Water	3 ounces

Sweeten with honey or molasses and give one teaspoonful every three to five hours.

4. Very often an emetic is useful, such as:

Powdered lobelia	1 teaspoonful
Powdered bayberry-bark	½ teaspoonful

Steep thirty minutes in saffron tea; strain and sweeten with honey, and give one to two teaspoonfuls every fifteen minutes until vomiting and relief are obtained.

SORE MOUTH—CANKER.

A disorder very common in infancy and childhood and sometimes affecting adults.

Treatment.—1. To correct the acidity of the stomach, which causes the disorder, give small doses of a few grains of prepared chalk or calcined magnesia dissolved in sweetened water. Wash the mouth frequently with the following excellent gargle:

Sumach berries	2 tablespoonfuls
Sage leaves	2 tablespoonfuls
Hyssop leaves	1 tablespoonful
Borax, pulverized	1 teaspoonful

2. Make a very strong tea, with a pint of boiling water, of the first three ingredients; sweeten with syrup or honey, and add the borax; stir well together and use frequently.

3. To cure canker in infants who are still nursing, the mother should chew small pieces of rhubarb root, two or three pieces the size of a pea every day. This will benefit the child through the mother's milk. For grown children and adults the following laxative will probably cause the canker sores to disappear:

Flowers of sulphur	1 tablespoonful
Cream tartar	2 teaspoonfuls

Mix in one-half cupful of syrup and take one teaspoonful three or four times a day.

4. In some cases these little sores are very hard to get rid of, and assume a very angry appearance. For this phase of the disorder the following is highly recommended:

Tincture perchloride of iron	½ drachm
Glycerine	½ drachm

Mix. Dip a camel's-hair brush into the mixture and lightly touch the ulcers with the point of the brush; after holding it there a moment, rinse out the mouth with tepid water. This is a little painful, but usually produces a radical cure.

CONSTIPATION.

Treatment.—1. An excellent powder, safe and sure, and which ought to be kept constantly on hand, is the cathartic powder.

Pulverized jalap	4 ounces
Pulverized senna	8 ounces
Pulverized cloves	1 drachm
Cayenne pepper	½ drachm

Mix all together and pulverize well. Dose for an adult: One heaping teaspoonful in a glass of water; spice with nutmeg to make it more palatable, if desired. Very good for occasional or chronic constipation.

2. The following is well adapted for frequent or daily use in habitual constipation, but is hardly so active as the preceding powder:

Powdered senna	2 ounces
Powdered licorice	2 ounces
Powdered fennel	1 ounce
Flowers of sulphur	1 ounce
White sugar	6 ounces

Mix and pulverize well together. Dose: One teaspoonful in one-half glass of water well stirred up. For children, reduce the dose in proportion to age. When there are dropsical or congestive symptoms add a teaspoonful of cream tartar to each dose to stimulate the removal of the fluids from the system.

3. Habitual constipation is hard to cure, and calls for strict observance of dietary regulations. Coupled with a proper diet and mode of life, the following mixture will be found highly useful:

Cayenne pepper	30 grains
Cream tartar	2 grains
Flowers of sulphur	4 drachms
Pulverized charcoal	2 teaspoonfuls
Molasses or honey	1 teaspoonful

Mix. When bowels are tight take one-half teaspoonful on empty stomach once a day, or twice, if the symptoms are urgent. Another good plan is to get a two-ounce bottle of fluid extract of hydrastis, and take from four to six drops in a half-glass of water whenever there is any constipation. This is a most excellent remedy, and easily taken.

DYSENTERY.

Treatment.—1. In the acute stage, when there are severe pains in the bowels and frequent stools, give the following:

Powdered ipecac	20 grains
Flaxseed tea	1 gill

If pain is very severe, add to this one grain of powdered opium, or fifteen to twenty drops of laudanum.

2. In place of this, syrup of ipecac in teaspoonful doses repeated every hour until three or four doses have been taken will perhaps answer the purpose. Patient must be kept perfectly quiet in bed. The ipecac will induce perspiration, which can be further induced by the application of warm fomentations over the abdomen and hot bricks to the feet.

3. After the acute stage has passed, and not before, give an injection composed of:

Thin boiled starch	2 ounces
Laudanum	20 drops

repeating at intervals of six to twelve hours. Care must be taken not to check the discharge too suddenly.

4. Another prescription, good in any stage of the disease, is:

Tincture rhubarb	1 ounce
Laudanum	4 drachms
Sugar of lead, pulverized	½ drachm

Mix and shake well so that the sugar of lead will not settle to the bottom. Dose for adult: One teaspoonful every three hours. If the disease does not yield readily and considerable fever develops send for a physician.

DIARRHŒA.

Treatment.—1. It is usually best to begin treatment by giving a tablespoonful of castor oil, either with or without ten to twenty drops of laudanum. This aids in cleaning the unhealthy matter out of the intestines, and when this is accomplished, give an astringent and quieting remedy, such as:

Subnitrate of bismuth	1 drachm
Tannic acid	1 drachm
Paregoric	1 ounce
Aromatic syrup of galls	2 ounces

Mix and shake well. Dose: One teaspoonful every two hours.

2. Or take a carminative composed of:

Laudanum	½ ounce
Compound spirits of lavender	½ ounce
Spirits of camphor	½ ounce

Mix. Dose: Ten drops on sugar every hour or two until discharges cease.

3. A good blackberry cordial, such as the following, is often found to be a preventive and specific for summer complaint, diarrhœa, etc.:

Ripe blackberries	2 quarts
Sugar, white	1 pound
Cloves and allspice	½ ounce of each

Boil all together. When cold, press out and strain the juice and add a pint of good brandy. This makes a pleasant drink, and may be taken in quantities from a teaspoonful to a wineglassful every two to four hours. Be careful not to take too much astringent medicine and thereby check the diarrhœa too suddenly.

COLIC.

Treatment.—1. To relieve the pain give an injection of thin starch containing twenty to thirty drops of laudanum. To relieve the constipation give a seidlitz powder, or a tablespoonful of castor oil, to which may be added a teaspoonful or less of spririts of turpentine. The application of warm fomentations to the abdomen, or a mustard plaster wet with vinegar is also recommended. Soaking the feet in hot water is also of benefit. Colic is a very painful disorder, but seldom or never terminates fatally.

2. One of the best general remedies for colic, diarrhœa, pain in the stomach and bowels is the following cordial:

Gum myrrh	4 ounces
Ground nutmeg	½ ounce
Cayenne pepper	½ ounce
Good brandy or whiskey	1 quart

Pulverize the myrrh, nutmeg and pepper together; put them into a two-quart bottle; add the brandy or whiskey and cork tightly. Let it stand ten days or more, shaking frequently, then strain and bottle for use. Dose for an adult: One teaspoonful. An excellent and harmless remedy for colic, pain in the stomach and bowels, and very useful in diarrhœa. This preparation ought to be kept in the house constantly. In using this for colic do not neglect the use of a purgative also, such as a dose of castor oil or salts.

CHOLERA MORBUS.

Treatment.—1. To check vomiting and purging the following mixture is excellent:

Essence peppermint	1 ounce
Water	1 ounce
Carbonate of potash	20 grains
Paregoric	1 teaspoonful
White sugar or honey	2 teaspoonfuls

Mix and shake well. Dose: One teaspoonful every ten to twenty minutes, until patient becomes quiet. If necessary, keep up bodily heat by means of hot flannels or bricks to extremities. Patient should rest quietly.

2. Another remedy, highly prized by many, is:

Common salt	3 teaspoonfuls
Black pepper	4 teaspoonfuls
Cider vinegar	½ teacupful
Warm water	½ teacupful

Mix all together and take the whole dose, a tablespoonful at a time. If the first cupful is rejected, take another at once.

When stomach is settled take a powder composed of:

Powdered peppermint leaves	½ ounce
Powdered cloves	½ ounce
Pulverized rhubarb	1 ounce
Saleratus	1 ounce

Mix well together. Dose: One teaspoonful every thirty minutes, or less frequently after one or two doses. Hot fomentations applied to the stomach and abdomen are not out of place at any stage of cholera morbus.

CHOLERA INFANTUM.

Symptoms.—The first symptoms are heat and pain in the region of the stomach and bowels, hands and feet, followed by vomiting and purging, or both, with griping and severe pains at the pit of the stomach. Evacuations become greenish-yellow and slimy, frequent and painful. Vomit is also greenish and more or less offensive and sour. There is great prostration, with loss of bodily heat and intense thirst; later, a cold perspiration appears, and unless relief is afforded the patient speedily succumbs, or the disease passes into a chronic state.

Causes.—Causes are: unwholesome food, hot weather, bad ventilation, or painful teething.

Treatment.—1. The first step is to remove the cause—a nursing babe may suffer from an improper diet on the part of the mother. Give the patient pure air and sunlight—a trip to the country or on the water may be all sufficient. If the trouble comes from teething, have the gums lanced and cared for.

2. The treatment should generally be very simple When the symptoms first appear apply a spice plaster, or light mustard plaster, or flannels wrung out of hot water and spirits, over the whole abdomen; give a few teaspoonfuls of mint tea, and keep the child quiet as possible.

3. The following mixture has been used with great success, in early stages especially:

Prepared chalk	10	grains
Subnitrate of bismuth	10	grains
Paregoric	1½	teaspoonfuls
Syrup of ginger	5	teaspoonfuls
Gum arabic mucilage	5	teaspoonfuls

Mix. Dose for child one year old, one-half teaspoonful two to six times a day, usually not oftener than once in five or six hours. Vomiting may be relieved by giving small pieces of ice, if the child is old enough to swallow them. This treatment will often bring relief, but if it does not, give a teaspoonful of flaxseed tea or slippery elm tea, with (for a child four to six weeks old) one drop of laudanum, once in two or three hours.

4. If child is two or three months old, give two drops of laudanum; if six months old, give three drops; if a year or more give from four to eight drops, according to age. If the stomach will not retain this remedy apply it as an injection, using a tablespoonful of thin boiled starch, blood heat, to double the amount of laudanum prescribed above, that is, two drops for a child of thirty days, four drops for a child of two or three months, and so forth.

5. As a general rule, we may say, give as little medicine as possible, and if the simple remedies first named do not give prompt relief, as they very often will, with proper care, call a physician in preference to trying to handle the case in its severe forms.

SUMMER COMPLAINT.

Diet.—Pay strict attention to diet, which must consist of boiled rice, flour boiled in milk, parched corn, ground and boiled in sweet milk, no meats or fruits, except rice, fresh blackberries.

Treatment.—Give a small dose of castor oil, say one to two teaspoonfuls, followed, after ten to twelve hours by mild astringents and carminatives, such as those recommended for diarrhœa, graduating the dose according to age of patient. Do this early and no serious trouble need be feared.

DYSPEPSIA.

Treatment.—1. This curse is generally self-inflicted, and in most cases a strict observance of proper diet will afford relief, and, in time, effect a cure. In many cases a simple abstinence from one meal every day or two, for a while, will give the stomach a needed rest and relieve the patient. A plain but nutritious diet must be rigidly adhered to. One of the distressing symptoms of dyspepsia is "heartburn," which may be relieved by using the methods pointed out under that head.

2. Whilst the best results are attained by hygiene, the following anti-dyspeptic pills often produce a favorable effect in hastening a cure:

Pulverized rhubarb	1 drachm
Hydrastis	20 grains
Pulverized ipecac	30 grains
Oil cloves	10 drops

Make into sixty pills with extract of gentian, and take one or two pills daily.

3. Another formula which is much recommended by some physicians, is:

Pulverized rhubarb	1 drachm
Subnitrate of bismuth	2 drachms
Cayenne pepper	½ drachm
Pulverized aloes	½ drachm
Pulverized ipecac	15 grains

Make into sixty pills with gum arabic, and take one pill before each meal.

Accessory Treatment.—1. For a tonic cordial, take a gallon jug or bottle, fill it half full of wild cherries, and then fill it up with first-class rye whiskey or Jamaica rum. Let it stand for a week or more. Then take two tablespoonfuls twice a day. Do not use any more than the system requires as a tonic, and discontinue it as early as possible, so that there may be no developement of an undue appetite for spirituous liquors.

2. Probably the best of all digestive tonics is the following:

Tincture of leptandrin	1 ounce
Tincture of hydrastis	1 ounce
Tincture of colombo	1 ounce
Wine of pepsin	1 ounce

Mix. Dose: Two teaspoonfuls after each meal.

SOUR STOMACH—HEARTBURN.

Symptoms.—This common and distressing complaint results simply from undue acidity of the stomach caused by errors in diet or by dyspepsia. It produces a burning sensation in the stomach and under the breast-bone, often accompanied by nausea.

Treatment.—Take the following mixture, after meals, when the trouble occurs:

Baking soda	½ teaspoonful
Water	½ cupful

and avoid pickles, preserves, candies, sweet cakes and all sweetmeats.

CHILLS AND FEVER—FEVER AND AGUE—INTERMITTENT FEVER.

Treatment.—1. Upon the first indications of a chill, the following powder will be found useful:

Sulphate of quinine	30 grains
Prussian blue	1 drachm
Extract podophyllin, pulverized	30 grains
Cayenne pepper, pulverized	1 drachm
Charcoal, pulverized	1 drachm

Mix thoroughly and divide into twenty powders. Dose for an adult is two powders, taken every two hours, until chill has ceased and the hot stage begins.

2. After first powder is taken, patient may be placed in a warm bath and given hot chamomile or mint tea, with a copious sprinkling of cayenne pepper. In place of the warm bath, patient may be covered up warmly in bed and dry heat applied (by means of hot bricks, and so forth) along the spine to the extremities over the pit of the stomach, and so forth.

3. In the third stage (sweating) patient should be gently stimulated, if great weakness exists, with a little whiskey toddy, warm brandy or some similar drink. Between the ague fits, which may occur every other day, or once in three days, once in four days, or irregularly, give:

Sulphate quinine	30 grains
Sulphuric acid	30 drops
Pure water	1½ ounces

Mix in a bottle and shake well. Dose for an adult: One teaspoonful every two hours, or every hour, if necessary.

4. A good preventive of chills and fever is the following:

Good rye whiskey	4 ounces
Pulverized rhubarb	1 drachm
Pulverized Peruvian bark	1 ounce

Mix in a large bottle, and let it stand for some days. Take a good tablespoonful of the decoction three times a day during the continuance of aguish symptoms.

5. The following has been highly recommended by some practitioners:

Nitric acid	5 drops
Sweetened water	½ wineglassful

Take this mixture every four hours for two days. It has been known to have most favorable results.

CONGESTIVE CHILLS.

Symptoms.—A very severe form of chills and fever is in some cases marked by what are called "congestive chills," in which there is extreme weakness and distress, with clammy skin and every indication of approaching death.

Treatment.—The treatment is the same as for other chills of this character, but must be more energetic. Doses of quinine may be increased to ten or fifteen grains, given once or twice within an hour, with the administration of brandy and cayenne pepper to stimulate the vital forces. This form of ague is seldom seen, except in neglected cases, where the system is broken down and full of malarial taint.

SCARLET FEVER.

Treatment.—1. The first step is to reduce the fever, and for this purpose nothing is better than the following fever mixture for all forms of fever, and febrile symptoms attending small-pox and all eruptive diseases:

Sweet spirits of nitre	1½	ounces
Laudanum	2	drachms
Bromide of potassa	4	drachms
Syrup of ginger	4	ounces
Distilled water	6	ounces

Dose for adult: One tablespoonful every two to four hours, according to the severity of the fever. Dose for a child of ten years, two teaspoonfuls; for a child of five years, one teaspoonful.

2. When there is soreness of throat, apply a strip of fat salt pork or inside rind of fat bacon, sprinkled with salt and powdered camphor. A flannel cloth soaked in vinegar placed around the throat and covered with a dry cloth also gives relief; change every hour or two. The cold pack and frequent bathing with cold water are highly recommended, but must be applied with care.

3. It is claimed that the following treatment will nearly always terminate a fever if done promptly: Submerge the patient in water at a temperature of from 102 degrees to 105 degrees; very gradually add cold water until the temperature of the bath is reduced to 60 degrees, or even 50 degrees, and the temperature of the patient is brought down nearly to normal heat, 98½ degrees. This must be done in a warm room, free from draughts, or else the danger of taking cold is very great. Scarlet fever is a very dangerous disease at best, and a physician should always be called as soon as the disease manifests itself. In the meantime it is always safe to give the fever mixture in the doses specified.

BRAIN FEVER—MENINGITIS.

Treatment.—Treatment is directed to diverting the blood from the head, and keeping the bowels open. Soak the feet in hot water containing a tablespoonful of saleratus and apply either crushed or shaved ice to the head constantly, by means of ice-bags. Give a purgative, such as two blue-mass pills of five grains each, or the following:

Manna	1 ounce
Senna	1 ounce
Epsom salts	2 ounces
Powdered ginger	1 drachm
Water	1 pint

Steep thirty minutes, then bottle. Dose: Two tablespoonfuls three times a day or oftener if necessary to produce five or six motions of bowels every twenty-four hours. Call a physician at the earliest possible moment.

BILIOUS FEVER.

Treatment.—1. The first step is to relieve the trouble in the stomach and liver by means of an active purgative. Get a few blue-mass pills of three grains each, and take two or three at night, followed by a bottle of citrate of magnesia in the morning. This may be repeated the next day, if the purging from first dose does not seem to afford perfect relief from bilious symptoms.

2. If patient objects to calomel take instead the excellent antibilious pills made as follows:

Leptandrin	20 grains
Sanguinarian	5 grains
Podophyllin	5 grains
Ipecac	10 grains
Cayenne pepper	10 grains

Make into forty pills, with extract of dandelion. Keep these pills always on hand. They are unequaled as a cathartic in bilious fever or in any case when the liver is sluggish. Can be compounded at any drug store.

which will probably answer the purpose just as well. For an active purge take three or four pills.

3. Another good antibilious physic is the cathartic powder to be found under article on Constipation. After the fever has subsided give quinine in two-grain doses every hour or two, according to severity of attack. This mode of treatment will frequently cure in a very few days if begun early enough. If neglected, this type of fever will frequently run into a form of typhoid, which is very dangerous and hard to cure.

PNEUMONIA—LUNG FEVER—INFLAMMATION OF THE LUNGS.

Treatment.—1. Upon the appearance of the first symptoms the patient should be put to bed in a reasonably warm room, well ventilated, but free from draughts. Put a large mustard plaster, or flannels wrung out of hot water, over the seat of pain in the lungs; give copious draughts of hot composition tea, made from the following:

Powdered bayberry	8	ounces
Pulverized ginger	4	ounces
Pulverized cloves	½	ounce
Cayenne pepper	½	ounce

Pulverize together and mix well. One teaspoonful of the powder to one pint of boiling water makes a tea of proper strength. Drink freely; useful to produce a perspiration in coughs, colds, catarrh, pneumonia, pleurisy and all cases where sweating is desired.

Apply hot bricks or flat-irons to feet and limbs, and thus induce a profuse perspiration, continued several hours; give quinine in two-grain capsules, one every two hours, or more frequently if patient is accustomed to its use.

2. If cough is very tight or troublesome give an expectorant, such as the following mixture:

Chloride of ammonia	1	drachm
Brown mixture	1	ounce
Syrup of squills	½	ounce
Jamaica rum	4	ounces

Mix. Dose: One teaspoonful every two hours.

3. If strength fails, as is nearly always the case, dose the patient well with milk punches to stimulate the vital forces and aid expectoration.

Apply this treatment early and energetically, and if it does not give prompt relief, the case is too serious to be handled without good medical advice.

PLEURISY.

Treatment.—1. In ordinary cases the treatment is simple. The patient should be put to bed in a warm room. Apply flannels wrung out of hot water or mustard plasters over the seat of pain in the side. If necessary, to relieve the pain, a few drops of laudanum may be sprinkled on the plaster before applying. Give plenty of hot composition tea (see article on Pneumonia) or tea made from pleurisy root; apply hot bricks to the extremities, and get up a good perspiration. A good dose of salts is generally needed and should be given, say a tablespoonful.

2. If there seems to be much effusion of water into the pleural cavity, give two of the hydragogue cathartic pills made as follows:

Comp. extract colocynth	40	grains
Gamboge	15	grains
Podophyllin	10	grains
Oil of caraway	10	drops

Make into twenty pills with gum arabic mucilage. Dose for adult: Two or sometimes three pills.

This treatment, faithfully administered, will cure ninety-nine cases out of a hundred, if applied early.

INFLAMMATION OF THE BOWELS.

Symptoms.—This rather uncommon disease is characterized by fever, constipation and pain in bowels, most intense in region of navel and right flank. Unlike colic, the pain is increased by pressure from the outside.

Treatment.—1. Patient should be kept perfectly quiet in bed. Swallowing cracked ice will subdue nausea, and chewing small pieces of rhubarb-root will often supply the mild laxative needed. Apply warm fomentations to abdomen, such as large flaxseed poultices, plentifully sprinkled with laudanum. Flannels wrung out of hot water and spirits are also useful.

2. After relief has been secured, it is well to give once or twice daily a mild aperient composed of

Castor oil	3 ounces
Olive oil	2 ounces
Oil turpentine	2 teaspoonfuls

Dose for adult: One tablespoonful.

INFLAMMATION OF THE BRAIN.

Practically this disease is identical with brain fever or meningitis, which see.

INFLAMMATION OF THE STOMACH—GASTRITIS.

Treatment.—The best that can be done by home treatment is to depend chiefly upon external applications: mustard plasters to the stomach, light poultices of flaxseed meal sprinkled with laudanum, and so forth. The stomach must be allowed to rest absolutely, and it is well to have patient take nourishment by means of enemas, such as beef-tea injections. Internal medicines should be given only under a physician's directions in this case.

GASTRIC FEVER.

This is essentially similar to a mild form of bilious fever.

ERYSIPELAS.

Treatment.—1. The best wash for erysipelas of the face or head is:

Goulard's extract	2 teaspoonfuls
Distilled water	4 tablespoonfuls
Acetate morphia	2 grains

Mix and apply by laying linen cloths, wet with the mixture, over the affected parts.

2. It is said that the following remedy is almost a specific:

Tincture chloride of iron	1 ounce

Take from ten to fifteen drops in two tablespoonfuls of sweetened water every two hours. Steaming the part in the vapor of hot herbs—lobelia, bloodroot, etc.—is recommended by some practitioners. The cranberry poultice, made from boiled or raw cranberries, mashed, has also been used with success. It is important to keep up the strength, and quinine may be administered in doses of two grains every four hours. Alcoholic stimulants are frequently found indispensable, and good champagne, or old rye whiskey, will be found the best for the purpose. Never apply any ointments or greasy substances of any kind to the inflamed surface. If this treatment fails to give prompt and marked relief a physician should be called at once.

SMALL-POX.

Treatment.—Comparatively little medical treatment is required. More depends upon nursing and diet. Fever mixture should be used to allay the fever. The following mixture will be found efficacious:

Sweet spirits of nitre	1½ ounces
Laudanum	2 drachms
Bromide of potassa	4 drachms
Syrup of ginger	4 ounces
Distilled water	6 ounces

Dose for adult: One tablespoonful every two to four hours, according to the severity of the fever. Dose for a child of ten years, two teaspoonfuls; for a child of five years, one teaspoonful.

To relieve the itching the following mixture will be found efficacious:

Solution carbolic acid	½ drachm
Pure water	5 ounces

Apply with sponge or soft rag. For the ointment nothing is better than cosmoline or plain vaseline. In case tonics are needed to support strength, two-grain quinine pills, in doses of two pills three times a day, will be found convenient to administer. Brandy and milk-punches may be given in small and frequent doses, say from one to two teaspoonfuls every hour, or more frequently. If extreme prostration exists, call a physician at once.

MEASLES.

Generally speaking, no active treatment is required. If fever runs high, use fever mixture, as recommended under small-pox. Dose: one teaspoonful for a child from two to six years of age; two teaspoonfuls for a child of eight to twelve years, increasing according to age. Cathartic must be used very carefully, if at all, as diarrhœa frequently occurs, and is apt to be obstinate. Should the bowels become very loose, it is well to check, but not stop, the diarrhœa by the use of

Aromatic syrup of galls	1 ounce
Laudanum	40 drops

Dose: Half teaspoonful every two or three hours. Give the patient all the cold water he craves, and do not heat the body with hot teas, heavy blankets, etc.

MUMPS.

Treatment.—Nothing is needed beyond rest and proper care, except an occasional dose of salts, or, if the pain is very severe, the application of a poultice, made from mullein leaves, with a sprinkling of laudanum. Diet should be looked after.

NERVOUSNESS.

Treatment.—1. General nervous excitability, such as is seen in delicate women, can often be controlled by the use of the following nerve tonic:

Spirits of camphor	½ ounce
Comp. spirits of lavender	½ ounce
Tincture valerian	1 ounce
Sulphuric ether	½ ounce

Mix. Dose: One or two teaspoonfuls every three hours.

2. When there is extreme nervous debility, with a tendency to fainting fits, the following mixture is very useful:

Spirits camphor	1 ounce
Aromatic spirits ammonia	½ ounce
Spirits lavender compound	½ ounce
Tincture valerian	1 ounce
Tincture castor	1 ounce

Mix. Dose: From one to three teaspoonfuls at intervals of from fifteen minutes to three hours, according to urgency of symptoms. This mixture should be kept on hand by all persons subject to fainting fits.

PAINFUL MENSES—DYSMENORRHEA.

Treatment 1.—This disorder is hard to cure, but the painfulness of the attacks may be mitigated very much, sometimes, by using the hot hip-bath, or at least soaking the feet in hot mustard water. Hot fomentations should be applied to the abdomen, and copious draughts of hot pennyroyal tea given. Constipation must be carefully guarded against, both during the attack and during the intermediate period. (See "Constipation.")

2. The use of tonic pills is recommended, to be taken three times a day, one pill after each meal. They should be made thus:

Sulphate quinine	1 grain
Citrate iron	2 grains
Strychnine	1-60 grain

Have fifty of these pills made by a good apothecary.

Or thus:

Sulphate quinine	2 grains
Iron reduced	2 grains

Have twenty-five of these pills made.

FLOODING—MENORRHAGIA.

Treatment.—1. For an astringent, to be taken after the second or third day of the attack—not before:

Fluid extract viburnum	½ ounce
Gallic acid	40 grains
Infusion of matico	4 ounces

Mix. Dose: Five teaspoonfuls every three hours, until flooding ceases.

2. This may be supplemented by the use of oil of erigeron:

Oil of erigeron	1 drachm

Dose: One drop on lump of sugar every ten to thirty minutes, according to urgency of the case; usually this is not needed.

3. An infusion of the leaves of erigeron (fleabane), one ounce to pint of water, freely drank, say half a teacupful or more, three or four times a day, will often answer all purposes when used alone.

LEUCORRHEA—"THE WHITES."

Treatment.—In addition to the use of tonics, the following has been highly recommended:

Tincture of aloes	2 ounces
Muriated tincture of iron	½ ounce

Mix in a bottle. Dose: Thirty-five drops (about one-half teaspoonful) in a gill or more of water three times a day.

Auxiliary Treatment.—In addition, use one of the following injections:

Sugar of lead	2 ounces
Sulphate of zinc	2 ounces

Mix well together. Put one-half teaspoonful into a pint of hot water, and use as an injection three or four times daily. Use a full pint every time, as hot as can be borne. One-half teaspoonful of powdered alum to the same quantity of water may be used instead, but mixed powder is generally better.

Good results are sometimes obtained by using as an injection an infusion of white oak bark, one tablespoonful to a pint of water.

CONVULSIONS—INFANTILE FITS.

Causes.—Indigestion, worms or the irritation of teething are the usual causes of fits in childhood, or "spasms," as they are called.

Treatment.—1. Place the child in a warm mustard bath, say about two teaspoonfuls of mustard to one bucketful of water, and at the same time apply cold water to the head; this will relax the spasm and allow you to take steps to remove the cause of the trouble. If the child is teething and the gums are hot and swollen they should be lanced and allowed to bleed freely.

2. If indigestion or constipation seems to be the cause, give from fifteen to thirty drops of castor oil, in gruel, and an injection of warm, soapy water. Sometimes a simple emetic should be first given.

3. If you have reason to suspect that the child has worms, proceed as directed in article on worms, which see. To prevent the recurrence of the spasms the bowels must be kept reasonably free by giving small doses of castor-oil daily. The warm bath, with cold water on the head, rarely fails to give instant relief from the severe and threatening symptoms. It should be applied at once, when spasm commences.

4. The following is an excellent remedy for infantile convulsions:

Chloroform	½ drachm
Bromide of potash	½ drachm
Tincture of cardamon	½ ounce
Spearmint water	2½ ounces

Shake well and give one-half teaspoonful in water to child one year old, smaller children a proportionate dose.

CONVULSIONS—EPILEPTIC.

Causes.—The causes of this strange disease are but imperfectly understood, and no infallible remedy has yet been discovered.

Treatment.—1. Total abstinence from rich and animal food, with hygienic modes of living constitute the best defense of an epileptic patient.

2. When adults are laboring under the paroxysm little in general can be or ought to be done, except bringing the patient into the fresh air, taking off what may be around the neck and baring the chest, together with the more imperative duty of preventing the patient from doing himself any injury. If the paroxysm be prolonged greatly, the application of cold to the head may be of some service. The inhalation of ammonia or chloroform has been found useful.

CROUP.

Treatment.—The main point is to act promptly; give the child a hot mustard bath; give twenty drops of syrup of ipecac every ten minutes until vomiting is induced; if the ipecac does not act promptly give the following:

Powdered alum	2 teaspoonfuls
Molasses	1 tablespoonful
Warm water	1 cupful

Mix and give a tablespoonful every five minutes; also rub chest, neck and back with a good stimulating liniment.

The Liniment.—The following is an excellent one:

Water of ammonia	2 drachms
Chloroform	2 drachms
Laudanum	½ ounce
Spirits of camphor	½ ounce
Soap liniment	3 ounces

Mix.

If above treatment is followed out the much-dreaded "midnight horror" can be treated in most cases without the assistance of a physician. Should the attack, however, prove to be the membranous form, and refuse to yield to above treatment, the family physician should be summoned at once.

DIPHTHERIA.

Diphtheria is both a contagious and infectious disease, and not to be trifled with. Always rely on the advice of a physician, who should be sent for as early as possible. The following remedies will prove helpful in a large number of cases, especially if treatment is begun early:

Treatment.—1. The new serum treatment of diphtheria by hypodermic injections of diphtheria anti-toxine has proved very successful and is a wonderful addition to modern medicine. This treatment is administered only by the physician.

2.—

Powdered alum	2 drachms
Chlorate of potassa	1 ounce
Permanganate of potassa	30 grains
Pure water	1 pint

Mix and use as a gargle every hour or two.

3. To make lime-water, put a piece of quick-lime, the size of a hickory nut, into an eight-ounce bottle and fill with water; let it stand a short time, until water is thoroughly impregnated with the lime. The best way to apply this is with an "atomizer," a little instrument which acts something like a syringe, but ejects the liquid in the form of a fine spray.

4. The throat may also be treated with tannin and glycerine prepared as follows:

Tannin	1 drachm
Glycerine	1 ounce

Heat the glycerine somewhat, so as to thoroughly dissolve the tannin, and stir or shake well while dissolving. Apply to sore spots in throat by means of a swab or a throat brush.

Internal Treatment.—For internal treatment use the following most excellent prescription:

Chlorate of potash	1	drachm
Tincture of chloride of iron	1½	drachms
Syrup of lemon	1	ounce
Spirits of mindererus	4	ounces

Mix. Dose: One teaspoonful every two hours.

If this prescription cannot readily be filled, a fairly good substitute is the tincture of chloride of iron; get about one ounce of this and take ten drops in a wineglassful of water three times a day. This is a valuable tonic, but in addition, if there is much failure of strength, use the following:

Sulphate quinine (powder)	1 drachm
Best brandy	1 pint

Mix and dissolve. Dose: Two teaspoonfuls every three hours in half a glass of water.

QUINSY SORE THROAT.

Treatment.—The best that can be done is to prevent swelling and suppuration. Use the gargle recommended for diphtheria, and keep hot poultices constantly on throat, under the chin and ears. By this means the disease can generally be cut short, but if it progresses to suppuration the attendance of a physician is required. Poultices made from hops are generally as good as anything; the application of fat pork sprinkled with pepper has also been recommended, but the poultice always gives the best results. The bowels must be kept open, and for this purpose epsom salts are generally used, unless there is a condition of biliousness, in which case the following pills are preferable:

Leptandrin	20 grains
Sanguinarin	5 grains
Podophyllin	5 grains
Ipecac	10 grains
Cayenne pepper	10 grains

Make into forty pills, with extract of dandelion. Keep these pills always on hand. They are unequaled as a cathartic in bilious fever, or in any case when the liver is sluggish. Can be compounded at any drug store.

SIMPLE SORE THROAT.

Treatment.—Usually the result of a cold. Upon first appearance, use a gargle of chlorate of potash, or take a pinch of the powdered chlorate of potash and allow it to dissolve slowly in the mouth, laying or inclining the head in such a way that the saliva will trickle over the sore surface. This will usually cure, if begun in time, but if not successful within a day or two make a gargle of

Powdered alum or borax	1½ teaspoonfuls
Water	1 gill

and use every hour or two.

Accessory Treatment.—If there is much debility or loss of strength, tonics should be used, such as tonic pills, as recommended for hay fever, which see, or the tincture of chloride of iron, recommended for diphtheria. Swabbing the throat with the tannin and glycerine mixture is also very efficacious, but the simple chlorate of potash gargle will often end all trouble.

PUTRID SORE THROAT.

Symptoms.—This form of sore throat is accompanied by ulceration more or less severe, and occasionally of a malignant type, resembling diphtheria.

Treatment.—The treatment is much the same as that for diphtheria, with gargles and tonics. The tannin and glycerine mixture often gives relief, and a strip of fat pork, sprinkled with cayenne pepper and applied to the throat, has been used with good results. It is important to keep up the strength with iron and quinine tonics, as recommended for other throat diseases. Like diphtheria, this disease requires prompt and intelligent treatment, and if not speedily subdued by home remedies a good physician is needed at once.

DROPSY.

Treatment.—1. One of the best prescriptions ever formulated for general dropsy is the following:

Acetate of potash	½ ounce
Basham's iron mixture	2 ounces
Spirits mindererus	2 ounces

Mix. Dose: One tablespoonful four times a day. This will seldom fail to afford relief.

2. Hydragogue cathartics are needed, such as the following:

Powdered jalap	10 grains
Cream tartar	1 teaspoonful
Sweetened water	1 wineglassful

This mixture may be taken once every four hours until copious watery discharges are produced.

3. A good diuretic mixture (to produce a profuse flow of urine) is this:

Infusion of digitalis (foxglove)	2 teaspoonfuls
Cream tartar	1 teaspoonful
Pure water	1 gill

If the symptoms are not very urgent, this may take the place of the hydragogue cathartics recommended above.

4. For almost any kind of dropsy, a tea made from bruised juniper berries or the tops of broom corn (one ounce to a pint of water), may be used with advantage Dropsical patients must take as little liquid food as possible.

RHEUMATISM—ACUTE OR INFLAMMATORY.

Treatment.—In addition to external remedies the disease is often controlled within two or three days by the use of the following:

Salicylate of soda	2 drachms
Wine of opium	1 drachm
Bicarbonate of potash	2 drachms
Syrup of lemon	1 ounce
Pure water	3 ounces

Mix. Dose: One teaspoonful every two hours.

Great care must be observed in watching the patient's temperature, as great danger attends the over-heating of the blood, which is apt to occur in acute rheumatism.

RHEUMATISM—CHRONIC.

Treatment.—Many methods of treatment have met with more or less success, but the following is said to be the most generally satisfactory:

Tincture gum guaiacum	1 drachm
Iodide of potassium	1 drachm
Wine of colchicum	1 drachm
Elixir of orange	2 ounces
Simple syrup	2 ounces

Mix. Dose: Two teaspoonfuls four times a day.

External Treatment.—A good liniment, which must be rubbed persistently and frequently, with considerable friction, on the affected part, is composed of:

Laudanum	6 drachms
Chloroform	4 drachms
Oil of red thyme	2 drachms
Liquid opodeldoc	2½ ounces

Mix and apply several times daily.

RHEUMATISM—MUSCULAR.

"Stiff neck" and "pain in the chest" are two of the most common forms of this malady.

Treatment.—The use of belladonna plasters is recommended, to be applied over the seat of pain; also the following mixture:

Wine of colchicum	½ ounce
Wine of opium	1 drachm
Syrup of lemon	1 ounce
Distilled water	2 ounces

Mix. Dose: One teaspoonful every two hours. The liniment recommended above for chronic rheumatism may also be used with advantage.

NEURALGIA.

Treatment.—1. When associated with debility, anemia, or "bloodlessness," as is apt to be the case, iron and quinine tonics are useful, such as tonic pills recommended for sciatica, which see.

2. Another good form of iron is the tincture of chloride of iron, taken in doses of ten drops in a wineglassful of water, three times a day.

External Treatment.—1. In addition to internal treatment, which is essential, stimulating liniments often do much good in alleviating pain. The following stimulating liniment has been highly recommended:

Spirits of ammonia (hartshorn)	1 ounce
Olive (sweet) oil	3 ounces
Chloroform	1 ounce
Tincture of camphor	1 ounce

Mix. Apply with hand, rubbing in persistently.

2. In place of this the following, or that recommended for rheumatism, may be used:

Laudanum	2 ounces
Spirits turpentine	3 ounces
Olive oil	2 ounces
Tincture camphor	2 ounces
Spirits ammonia	½ ounce

Mix. Useful for sprains, swellings, pains in muscles and joints, etc. Also for neuralgia and rheumatism. Keep bottle well corked.

3. Some practitioners have had great success with an ointment made of

Extract belladonna	½ ounce
Plain vaseline	2 ounces

Mix. Rub on affected part several times a day. The external applications tend to reduce the pain, while the tonics are renewing the strength and "tone" of the nerves. Belladonna plasters are very useful in cases of neuralgia of chest, or other parts where the plasters can readily be applied, but the tonics must not be neglected.

SCIATICA.

As this is a form of neuralgia, the treatment should be by means of the following:

Sulphate quinine	1 grain
Phosphate iron	2 grains
Strychnine	1-50 grain

Have fifty of these pills made; take one after each meal. **Specially useful in neuralgia and rheumatism, with good results.**

The use of these tonics will tend toward a cure, but the disease is very obstinate, and strict observance of hygienic precautions is imperative. In this disease, as in lumbago, the use of belladonna plasters, which may be bought at any drug store, often contribute to relieve the intense pain.

External Treatment.—The liniment as prescribed for rheumatism is also useful, and should be faithfully applied; or the liniment and ointment recommended for neuralgia may be employed with good results.

Use of Opiates.—When it is necessary to administer opiates to subdue the intense pain, it should be done under the advice of a physician. In an emergency, a dose of from fifteen to twenty drops of laudanum may be administered, either on lump sugar or in a tablespoonful of water.

RINGWORM.

Treatment.—1. A radical cure may be effected by the use of nitrate of mercury (in the form of citrine ointment) as per following formula:

Citrine ointment	1 drachm
Vaseline or cosmoline	1 ounce

Mix and thoroughly incorporate. Wash the affected part clean and apply this **ointment, on a soft rag, three times a day. This is also a specific for barber's itch, scald-head and all other diseases which are due to the presence of vegetable parasites.**

2. In obstinate cases cures have been effected by painting the affected surface quite freely with tincture of iodine twice every day for two weeks, and then applying an ointment made of

Corrosive sublimate	2 grains
Vaseline or cosmoline	1 ounce

Mix thoroughly. This must be used with the greatest care.

BARBER'S ITCH.

Treatment—1. In addition to the citrine ointment and vaseline recommended for ringworm, the following will be found excellent for barber's itch, and an almost infallible cure for common itch:

Plain vaseline	4 ounces
Sulphur	2 ounces
Sal ammoniac, powdered	2 drachms

Mix and apply daily, after cleansing the part thoroughly with castile soap-suds.

2. Another good ointment is composed of:

Plain vaseline	2 ounces
Venice turpentine	½ ounce
Red precipitate	½ ounce

Apply in same manner. Great care should be taken not to expose affected parts to cold or draughts while ointment is in use, especially if the affected surface is large.

SCALD-HEAD—FAVUS.

Treatment.—Cut or shave off the hair; apply a bread-and-water poultice until the crusts are softened and can be removed; then use the following ointment:

Plain vaseline	2 ounces
Sulphur	½ ounce

Mix thoroughly and apply with the hand, rubbing in well. If necessary, remove the roots of the hair with a pair of tweezers; in ordinary cases this is not required. (See also "Ringworm.")

SHINGLES—HERPES.

Treatment.—It is well to give a teaspoonful of cream-tartar in sweetened water every night for a few days, and to bathe the whole surface of the body in saleratus water. The burning and itching may be relieved by using the following wash:

Goulard's extract	2 teaspoonfuls
Acetate morphia	2 grains
Distilled water	2 ounces

Apply by means of soft rags to affected surface, changing frequently.

HIVES—NETTLE-RASH.

Causes.—As this disorder is ascribed to indiscretion in diet, the first step is obviously to rid the stomach of the offending matter by means of an emetic, and then to avoid the cause of the disturbance. When the cause is unknown, great relief, and often a cure, will result from the following treatment:

Treatment.—Dust the affected parts freely with fresh rye flour, and at the same time drink copious draughts of rye flour water. Some very stubborn cases have yielded to this remedy.

TETTER—ECZEMA—PSORIASIS.

Treatment.—There are several varieties of this disorder, but a good ointment for almost any form is made as follows:

Venice turpentine	1 ounce
Red precipitate	3 drachms
Vaseline, plain	4 ounces

Melt the vaseline and turpentine together in a cup and stir in the precipitate while cooling. Mix well.

Apply a little of this ointment to the affected surface twice a day, first cleansing the sore with warm water and a little castle soap. Internally, use the following: Fowler's solution, five drops on a lump of sugar, three times a day. It is often advisable to use an alterative syrup also, such as recommended for scrofula.

FRECKLES.

Treatment.—Freckles are sometimes removable and sometimes not. The following lotions are as good as any:

Rain water	8 ounces
Borax	½ ounce

Mix and dissolve; wash part twice daily.

Rose water	4 ounces
Alcohol	½ ounce
Hydrochloric acid	½ drachm

Mix and apply with sponge or rag three times daily. Painting with tincture of iodine is sometimes effective. Generally speaking, it is best to leave the freckles alone.

SUNBURN.

Anoint the affected surface two or three times daily with plain vaseline or cosmoline, or benzoated zinc ointment.

CHAFING.

Treatment.—Afflicts children and fleshy persons. Usually all that is required is washing well with castile soap and cold water, and anointing with plain vaseline. A solution, to be used twice a day in connection with frequent washing in cold water, is composed of:

Pure water	2 gills
Powdered borax	1 teaspoonful
Sulphate of zinc	½ teaspoonful

Apply by means of a soft rag several times daily. After drying well, dust the parts with wheat flour or cornstarch or powdered magnesia.

SCROFULA.

Treatment.—1. Iodide of iron, with quinine and other tonics, constitute the best treatment. Get an ounce of syrup of iodide of iron and take twenty drops in a wineglassful of water three times a day. In addition to this, get about fifty tonic pills, composed of:

Citrate of iron	1 grain
Sulphate quinine	1 grain
Arsenic	1-16 grain

These may be coated with sugar or gelatine. Take one pill thrice daily.

2. A good alterative syrup can be made as follows:

Yellow dock root	1 pound
Stillingia root	1 pound
Dandelion root	1 pound
Imported sarsaparilla	1 pound
Bark of sassafras root	½ pound
Water	4 gallons

Cut the roots, etc., up fine and boil slowly in the water until reduced to four quarts; then strain, pressing out the liquor from the solid matter; add to the liquor five pounds of white sugar, stirring in with gentle heat. Add also about eight drachms of iodide of potassa, or at rate of two drachms to each quart of syrup. Put in bottles, well corked. Dose: Two tablespoonfuls three times a day.

3. A good wash or lotion for indolent scrofulous sores is:

Carbolic acid, crystals	30 drops
Pure water	1 pint

Mix and apply with soft rag three or more times daily.

SORE EYES—CONJUNCTIVITIS.

Treatment.—1. In simple cases, where there is heat and pain in the eye, with some redness of lids and white of eye, this lotion is generally effective:

Borate of soda	2 grains
Camphor water	1 ounce

Mix. One or two drops in eye four times a day; also, saturate a small piece of lint in this mixture and apply it over the eye.

2. Another good lotion is composed of:

Hydrastis (Golden Seal) root	½ ounce
Best green tea	½ ounce
Sulphate zinc, pulverized	1 drachm

Steep the root and tea for a few minutes in a pint of boiling water; while cooling, add the sulphate of zinc; when cold, strain well and bottle. Use as an eye wash three times a day. In severe cases a poultice is useful, made from pulverized slippery elm and warm milk and water. In most cases an active purgative is needed, such as a 5-grain blue pill at evening for two or three days, followed each morning by about half a bottle of citrate of magnesia or a seidlitz powder. In place of this the anti-bilious pills (see article on Bilious Fever) may be used.

All eye-washes must be used with caution, especially those containing belladonna or caustic solutions, or more harm than good may result.

CHILBLAINS—FROSTED FEET.

Treatment.—1. The first treatment for frosted feet, to be applied at once, before the feet are "thawed out," is rubbing with snow and bathing them in ice-cold water. Let the normal blood-heat be restored very gradually, and continue the cold water treatment for some hours. Do not apply external heat of any kind.

2. For chilblains, the best treatment is frequent bathing in cold water and in a strong decoction of white oak bark. Bandaging the parts loosely with flannels saturated with crude petroleum has cured many cases. These are probably the best remedies, although many others have been tried with varying success.

CANCER—CANCEROUS ULCERS.

It is doubtful if true cancer has ever been cured, but there are certain malignant ulcers, cancerous in appearance and malignity, that sometimes yield to the simple remedies here given.

Treatment.—1. One of the best and most available remedies is the cranberry poultice. Mash raw cranberries to a pulp, spread on a cloth to make a thick poultice large enough to cover the entire affected surface, and apply direct to the sore. Change the poultice three times a day. This may add to the soreness at first, but if persisted in, it will generally effect a speedy cure.

2. Raw carrots, grated fine and moistened with water to make a smooth paste, may be used in place of cranberries, but the results are not usually so satisfactory. These remedies are worth trying in all cases of external cancer, and may be depended upon to cure many cases of malignant ulcerous sores.

CARBUNCLES—ANTHRAX.

Treatment.—1. To scatter the swelling and prevent the formation of pus (which may sometimes be done if taken in time), take:

Spirits of turpentine........................	4 ounces
Common salt	2 tablespoonfuls

Apply over seat of soreness or swelling, by means of several thicknesses of flannels, kept constantly wet with the solution.

Take one or two hydragogue cathartic pills, or the following powder, two successive nights:

Colocynth	8 grains
Podophyllin	2 grains
Gamboge	4 grains

Divide into two powders and take one each night, at bedtime, in syrup or ground cloves.

2. If the carbuncle develops, apply bread or flaxseed poultices and keep up the strength with tonics, such as:

Sulphate quinine	1 grain
Phosphate iron	2 grains
Strychnine	1-50 grain

Have fifty of the pills made. Take one pill three times a day after meals. If these pills are not available, take two grains of quinine three times a day, either in powder or the gelatine-coated pill.

BOILS—FURUNCLE.

Treatment.—A quick poultice for a boil is made of soap and brown sugar, equal parts, spread on a cloth and faithfully applied. To cleanse the system of the impurities which cause the formation of boils take this powder:

Flowers of sulphur	6 tablespoonfuls
Cream tartar	3 tablespoonfuls

Mix. Dose: One teaspoonful, night and morning, in syrup or molasses; continue for a week or ten days, but every third day omit this and take instead one-half teaspoonful of epsom salts in water, night and morning. Tonics may also be used as in "Carbuncle." When the boil has broken and the core is removed, dress with any good healing salve or plain vaseline.

JAUNDICE.

Causes.—Jaundice is a symptom rather than a disease. It indicates that there is some obstruction in the bile duct, which may result from a cold, a gall stone, or a thickening of the bile from some other cause. The bile, not being eliminated by the proper process and passed off into the intestines, is absorbed into the vascular system and diffused through the blood.

Symptoms.—This condition is manifested by yellowness of the skin and of the white of the eyes, loss of appetite, disinclination to stir around, sleepiness and sometimes sickness at the stomach. The bowels are constipated, and the excrement is hard and clayey; the urine is high-colored; there is generally a bitter taste in the mouth, and more or less pain in the right side.

Treatment.—1. The treatment is directed to cleaning up the bile duct, and forcing the bile into its proper channel. Probably the best remedy is this: Take a two-grain blue-mass pill twice daily for two or three days in succession—not longer. This is better than taking a larger dose once a day. If relief comes after one or two doses, take no more.

2. As a substitute for this, the following purely vegetable pills can be substituted, and often with equal success:

Extract taraxacum	40 grains
Podophyllin	4 grains
Leptandrin	10 grains

Make into twenty pills. Dose: One pill four times a day.

BLEEDING FROM THE LUNGS.

Treatment.—1. The most common remedy, and one usually effective, is common salt, which should be eaten freely, a teaspoonful at a time, until relief is obtained. A mixture composed of

Powdered sugar	3 ounces
Powdered rosin	3 ounces

Dose: One teaspoonful three times a day.

is also good.

2. In obstinate cases, the patient should be kept perfectly quiet, and this powder given:

Tannin	30 grains
Powdered sugar	1 drachm

Make ten powders and give one every ten minutes, or give one teaspoonful of wine of ergot every ten minutes.

[N. B.—Since spitting blood may be only a symptom of a much more serious trouble, a physician should always be called in when obtainable.]

BLEEDING FROM THE NOSE.

When obstinate, take cobweb or grated salt beef, hard and dry, and push it into the nostril as far as possible. External pressure from thumb and finger, continued fifteen or twenty minutes, will also be of benefit.

Another good method is to apply cold water or ice to forehead, also to back of the neck.

PALPITATION OF THE HEART.

Causes.—This disorder varies from a mere fluttering to the most distressing palpitation, and does not necessarily indicate a diseased condition of the heart itself, as it may proceed from nervous debility, indigestion and dyspepsia, too free indulgence in certain stimulants, severe fright or excitement, and so forth.

Treatment.—1. The first step is to discover where the root of the trouble lies. If it is general or nervous debility, the treatment is by tonics and nervines. If indigestion or dyspepsia causes the trouble, treat the patient for these disorders, as shown elsewhere in this volume. Many such cases are relieved by simply lying flat on the back and slowly taking a few deep breaths.

2. When indigestion or dyspepsia appears to be the exciting cause, a glass of plain soda water, or a drink made from a teaspoonful of baking soda in water, with a little citric acid added, will often give instant relief.

3. When the trouble is due to organic disease of the heart, a cure is probably impossible, but in such cases the following mixture is recommended:

Tincture of digitalis	½ ounce
Tincture of stramonium	½ ounce

Mix. Dose: Ten drops in water three times a day. In urgent cases the dose may be increased to fifteen or twenty drops. This is a good sedative and tends to relieve the nervous excitability of the heart; but it is always risky to continue the use of such a powerful medicine as digitalis for any length of time, except under a physician's immediate direction.

MILK LEG.

Treatment.—1. Sedatives, fomentations, perfect rest and simple diet is the most rational treatment to be followed for this affection. The fluid in which the fomentation flannels are to be wrung out is made by adding one pound of bicarbonate of soda and one ounce of extract of poppies to one gallon of boiling water. The flannels ought to be changed every thirty minutes and applied over the whole limb, and over the groin and lower part of the abdomen, wherever there is tenderness. The heat and steam from these fomentations are to be retained by means of impermeable cloths.

2. After using this a few days or a week, substitute for it the following stimulating liniment:

Oil of hemlock	1 ounce
Oil of origanum	½ ounce
Gum myrrh	2 ounces
Cayenne pepper	½ ounce
Gum camphor	½ ounce
Alcohol	1 pint

Mix and dissolve. Apply with hand, rubbing in gently but continuously.

3. The popular cure for milk leg, and that now most in vogue, is mercury in the form of blue ointment. Anoint the affected part freely with the ointment, and use it even to the point of partial salivation, if necessary.

4. After acute symptoms have subsided there is no remedy so beneficial as efficient bandaging, together with use of the tonic pills as prescribed under Carbuncle, which see.

WORMS.

Tape Worm.—Among the many remedies used by the profession, the following have been found useful and harmless to the patient.

1.—

Asafoetida	2 ounces
Garden rue	1 ounce
Garlic	1 ounce
Rye whiskey	1 quart

Bottle and let it stand for about ten days. Dose: One-half wineglassful three times daily, before meals.

2.—

Spirits of turpentine	1 tablespoonful
Castor oil	1 teaspoonful
Milk	1 cupful

Take this dose once a day. For a child under ten years, one-half the above, with or without the castor oil. This is also a good remedy for round or stomach worms.

3. A remedy thought to possess much value is:

Fresh pumpkin seeds	24 ounces

Macerate and grind to powder; divide into twelve portions, and take one portion three times a day. The bowels should be kept open with castor oil or some similar purgative, and the system stimulated by iron and quinine tonics; food should be kept from patient as much as possible while using this remedy.

Round Worms.—An excellent remedy for round or stomach worms is the following:

American wormseed	1 ounce
Cassia senna	1 ounce
Manna	1 ounce
Carolina pink root	1 ounce
Boiling water	1 quart

Macerate the first four ingredients thoroughly together and add the boiling water; let it steep in a closed vessel for an hour or more; sugar and milk may be added. Dose for a child: One gill four times daily, on an empty stomach. Good also for pin worms.

Pin Worms.—These may often be destroyed by using the following injection:

Powdered aloes	5 grains
Hot water	½ pint

Mix and divide into two injections and use at about blood heat.

The following has also been used with success:

Cream tartar	½ tablespoonful
Sulphur	1 tablespoonful

Mix in syrup. Dose for adult: One teaspoonful night and morning; for child under ten years, one-half the amount.

PILES.

Treatment.—1. For external piles this ointment is generally effectual:

Plain vaseline	1 ounce
Extract belladonna	10 grains
Tannin	30 grains
Powdered opium	20 grains

Mix well together and apply three or more times daily.

2. This will almost always cure. Another:

Plain vaseline	1 tablespoonful
Flowers of sulphur	1 drachm

Mix and apply three times daily.

INDOLENT ULCERS.

Treatment—1. Foul and indolent ulcers, old sores, and so forth, require cleansing and healing applications. Among the best washes is the followng:

Carbolic acid, crystals	20 to 40 drops
Pure water	1 pint

2. The well-known "black-wash" is also good, both for man and beast, and is made of:

Calomel	2 drachms
Lime water	½ pint

Mix and apply as a wash or on soft white rags.

3. An excellent ointment for old sores and ulcers, is made as follows:

Burnt alum	1 ounce
Red precipitate	4 drachms
White vitriol	2 drachms
Sugar of lead	4 drachms

Pulverize finely together and make into an ointment with one-half pound of cosmoline or plain vaseline. Heat the vaseline and stir in the mixed powder, allowing it to cool slowly whle stirring.

BITES AND STINGS.

Treatment.—The irritation and itching caused by the bites and stings of insects, such as the mosquito, bee, hornet, and so forth, are relieved by the prompt application of spirits of ammonia (hartshorn), or of the juice from common plaintain. Ordinary doses of sweet oil are also recommended for internal treatment, and it may also be applied externally with advantage. For treatment of snake bites and other poisoned wounds, see Poisons and Antidotes.

EARACHE.—INFLAMMATION OF THE EAR.

Treatment.—1. Beware of injections into the ear, or the use of any and all instruments. Either of the preparations here described will almost surely give relief:

Sweet oil	2 teaspoonfuls
Laudanum	1 teaspoonful
Honey (strained)	1 teaspoonful

Mix. Lie with head resting on the side opposite the inflamed ear, and drop from a warm teaspoon from four to six drops of this mixture into the affected ear; then stop with cotton.

2. Another, equally good, is:

Onion juice	2 teaspoonfuls
Sweet oil	2 teaspoonfuls
Laudanum	1 teaspoonful

Mix and use as above directed. Be sure to apply warm, not below blood heat. To get the onion juice, roast one or two large onions and press out the juice. It is a good plan to soak the feet in hot water and take an active cathartic if bowels are in the least constipated.

GOUT.

Treatment.—1. Relief may sometimes be obtained by holding the affected part in warm saleratus water or a weak solution of lye. An excellent poultice can be made as follows:

Powdered slippery elm	2 tablespoonfuls
Wheat bran	3 tablespoonfuls

Mix with a weak solution of lye or good vinegar and apply warm to the affected part. Change when dry.

2. A good purgative is:

Pulverized podophyllin	1 grain
Cream tartar	1 teaspoonful
Sweetened water	½ teacupful

After the bowels are freely moved, use this:

Tincture of black cohosh	2 ounces
Wine of colchicum	1 ounce
Iodide of potassa	1 drachm

Mix and take one teaspoonful three times a day.

GRAVEL.—CALCULUS.

An extremely painful and annoying disease, caused by stone or stony deposits in the kidneys or bladder.

Symptoms.—Symptoms are pain in region of kidneys and bladder, sometimes almost agonizing, frequent desire to pass water, and occasionally a partial or total stoppage of the urine. If the stone is located in the kidneys it is apt to produce nephritic colic.

Treatment.—1. This is chiefly palliative. To relieve the intense pain, use the following enema (injection):

Thin-boiled starch	2 ounces
Laudanum	30 drops

This injection must be retained in the bowels as long as possible. If pain is very severe, put in forty drops of laudanum. In place of this injection thirty drops of laudanum may be given internally every six hours, but the warm enema is better. Hot compresses over the abdomen and back are also useful.

2. In some diseases notably dropsy, plethoric headache, certain stages of pleurisy, and so forth, it is necessary to give a cathartic that will produce profuse watery discharges; therefore it is well to have about twenty pills of this character made by an apothecary from the following formula:

Comp. extract colocynth	40 grains
Gamboge	15 grains
Podophyllin	10 grains
Oil of caraway	10 drops

Make into twenty pills with gum arabic mucilage. Dose for adult: Two or sometimes three pills.

3. It is said that the following decoction, persevered in, will cure gravel:

Apple root tea	1 quart
Best Holland gin	1 pint
Loaf sugar	8 ounces

Dose: Small teacupful three times a day. To make the apple root tea, take a good handful of bark from root of a sweet apple tree and steep in hot water, in a closed vessel, thirty minutes.

GIDDINESS.—VERTIGO.

This is a symptom rather than a disease, and generally arises from a disordered stomach or (in women) a derangement of the menstrual functions. Ordinarily a good purgative, or sometimes an emetic, with hot foot-baths, will remedy the trouble.

GONORRHEA.

Treatment.—1. This should be chiefly by injection into the urethra and probably the best, especially for the earlier stages, is the following:

Fluid extract hydrastis	1 ounce
Distilled water	6 ounces
Gum arabic, pulverized	2 drachms

Mix and inject with proper syringe three or four times daily.

2. Another good injection:

Nitrate of silver	6 grains
Distilled water	4 ounces

This may be used after the first injection has been used for five or six days, if the inflammation still persists.

3. Observe care as to diet, and so forth. Should the disease run into the chronic form, known as "gleet," we recommend the following:

Tincture chloride of iron	½ ounce
Tincture cantharides	¼ ounce
Pure water	2 ounces

Mix. Dose: One teaspoonful three times a day.

NIGHT-SWEATS.

Treatment.—Sponge the body daily with a mixture composed of:

Powdered alum	4 ounces
Whiskey	1 quart

Quinine, to the extent of one to three two-grain pills thrice daily, is also useful.

PROUD FLESH.

Treatment.—To remove proud flesh from wounds or sores take a piece of alum the size of a walnut, parch or burn and pulverize it; sprinkle a little of the powder over the affected surface, and it will destroy the proud flesh, leaving the sores healthy and in good shape for rapid healing. In case proud flesh appears again, repeat the process.

ST. VITUS' DANCE.

Treatment.—To tone up the nerve forces, administer tonic pill. Dose: one pill after each meal. Continue taking them for some little time, say a month or more. In ordinary cases no other treatment is necessary.

BUNIONS AND CORNS.

Treatment.—Bunions are generally incurable, but the pain is relieved by painting with tincture iodine twice daily. Corns will disappear when the cause—tight or ill-fitting shoes—is removed and discarded.

BURNS AND SCALDS.

Treatment.—1. For a first application, nothing is better than the mixture of linseed oil and lime-water, made as follows:

Lime-water	3 ounces
Linseed oil	3 ounces

Mix and shake well. Apply on lint or soft rags. Never be without it.

This should be applied on lint, especially when the surface is raw, as ordinary cloth will adhere to the sore surface and cause much pain and suppuration. In cases where the skin is unbroken this lotion may be continued until recovery; but when the surface is raw and the skin nearly or quite destroyed, the lotion should be dispensed with after from eighteen to thirty hours, and the following healing ointment used instead:

Oxide zinc (finely powdered)	1 ounce
Balsam of Peru	10 drops
Cosmoline or vaseline	8 ounces

Heat the cosmoline and stir in the powdered oxide of zinc, being sure to mix well; add also the balsam and let it stand until cool. Apply on lint, using same precautions as are specified above.

2. If the lotion is not at hand, a fairly good substitute is a solution of common baking soda—one teaspoonful to a glass of water; but the lotion ought to be always in the house.

MORNING SICKNESS.

The "morning sickness," from which many women suffer during the early months of pregnancy, is exceedingly hard to relieve; in fact, it is sometimes impossible to do anything that will produce a favorable effect. It is better to attempt no medicinal treatment; but, in cases of extreme distress, an anti-spasmodic and anodyne mixture is sometimes required.

Treatment.—1. One of the best, perhaps, is the following:

Laudanum	½ ounce
Sulphuric ether	2 ounces
Alcohol	6 ounces
Oil of lemon	1 drachm
Oil of anise	1 drachm

Mix. Dose: One teaspoonful every half hour or somewhat more frequently if symptoms are very urgent and the sickness stubborn; do not give more than three or four doses, except under the direction of a physician.

2. Some practitioners have recommended the drinking of hot peppermint or chamomile tea upon rising in the morning as a means of averting these attacks, but the efficacy of this treatment is very doubtful. A tablespoonful or two of lime-water is more apt to be of service. It is important to keep the bowels free and regular, and in every other way to promote the general health.

PAINTER'S COLIC—LEAD COLIC.

Causes.—This is about the worst form of colic, and is attended by obstinate constipation, most violent pains, and more or less paralysis of the bowels and abdominal muscles. It is generally caused by inhaling the fumes arising from various preparations of lead, and the most frequent victims are painters and lead-workers.

Symptoms.—The attack generally comes on gradually, the pain beginning in the stomach and slowly extending downward. After a time the distress seems centered about the navel, and, in severe cases, there are shooting pains through the abdomen, with spasms of the intestines and abdominal muscles. Nausea is usually present, there is some vomiting, thirst, anxiety; the countenance is pale and contracted with pain; pulse is rapid; abdomen may become knotted and sore to the touch; the bowels seem paralyzed and incapable of expelling their contents. Unless relief is obtained inflammation of the bowels will occur, and death is almost certain.

Treatment.—1. The first thing to be done is to relieve the constipation by means of an active purgative, such as three to five of the antibilious pills (see Bilious Fever), and the application of hot fomentations over the whole abdomen. To relieve the spasm give an injection composed of:

Thin-boiled starch	2 tablespoonfuls
Laudanum	30 to 40 drops

Hypodermic injections of about one-eighth grain of morphia are also useful, but can be administered only by a physician.

2. In extreme cases, when the cathartic does not act promptly, it is sometime advisable to give from two to four drops of croton oil, on lump

sugar; but this is a dangerous drug in the hands of any one except a physician.

HAIR TONICS.

Preparation.—1. For falling of the hair and to prevent baldness, use either of the following preparations:

Alcohol	2 ounces
Distilled water	2 ounces
Castor oil	1 ounce
Pulverized borax	1 drachm

Mix the alcohol and castor oil together; then add the water and borax. Apply twice daily, rubbing well into the scalp with a stiff brush.

2. Or:

Alcohol	2½ ounces
Castor oil	½ ounce
Sulphate quinine	2 grains
Tincture cantharides	½ drachm

Mix and apply in same manner. This has sometimes worked like magic.

TO REMOVE WARTS.

Treatment.—Take a little nitric acid in a glass-stoppered bottle and add one-half as much water, making the acid two-thirds normal strength. Apply by means of a little piece of wood, such as a match-stick, taking care to have the stick merely wet, and not with a drop adhering. Hold it on the top of wart until there is a slight burning sensation. Do not apply enough acid to cause active burning. Repeat this process daily, and patiently. In the course of a week or more the wart will be gone. Be careful not to let the acid touch any healthy surface, and do not try to do the work all at once. Avoid making a sore, even if it takes two or three weeks to destroy the wart.

TO PRESERVE LEATHER.

Preparation.—1. Grease or tallow, when applied to boots or shoes, harness, and so forth, shortly becomes rancid, and rots the leather and stitching; but the following mixture will preserve leather and render it water-proof, viz.:

Beef tallow	1 pound
Pulverized rosin	12 ounces

Mix over a fire and melt together. Apply while hot with a brush and allow to soak in thoroughly. Apply to the soles of boots as well as the uppers.

2. If it is desired to polish the boots also, apply after a day or two:

White wax	1 ounce
Turpentine	1 teaspoonful
Lampblack	1 teaspoonful

Mix and dissolve. Apply cold, a light dressing of this mixture, and your boots will not only be water-proof, but will have a high polish.

TO REMOVE ODOR OF PERSPIRATION.

A frequent source of vexation to ladies and gentlemen is the unpleasant odor arising from perspiration. This may be entirely removed by adding one or two tablespoonfuls of hartshorn (spirits of ammonia) to each gallon of water used for bathing. Its excessive use, however, is not recommended, although no serious trouble can arise from it.

THE IDEAL HOME MEDICINE CHEST.

Purpose.—The purpose of the home medicine chest should not be to displace the family physician, or to take out of his hands the work that legitimately belongs to him, but rather to afford a convenient and ready means for giving relief in cases of minor indisposition where the physician would in all likelihood not be summoned, and in severe ailments for giving temporary treatment while awaiting his arrival. The intelligent mother who is watchful for any departure from the normal in her children, can often, if suitable remedies of a simple nature be at hand, prevent the development of more serious maladies.

Convenience.—Moreover, even among adults, it is often a convenience and a safeguard to have available such medicines as they will be most likely to have occasion to use in emergencies or in the absence of medical aid. The small expenditure of money required to procure such an outfit will be amply repaid by the peace of mind and ease of body which it will give. Before entering upon a detailed consideration of the remedies which it is desirable to keep in stock, a few suggestions as to the handling of medicines in general will not be inappropriate.

1. How to Keep Medicines.—All medicines should be plainly labeled, with their names, doses and general directions for use written in ink. Unless for temporary use only, liquids should be kept in glass-stoppered bottles. Never should a bottle be used which has contained something else, unless it has been thoroughly cleansed and the old label either scraped off or sufficiently defaced to prevent recognition. It is unsafe to simply paste a new label on top of the old one unless this precaution is observed, for the new one may not adhere, but may fall off, and occasion liability to error.

All poisonous liquids should be in blue or other dark-colored bottles and should have some distinctive characteristic to the touch, as a rough surface. They should be plainly marked "*Poison*," with directions to follow in case of poisoning by an overdose or otherwise. They should also be placed in a less accessible part of the medicine chest or closet, so as to make it more difficult to obtain them.

2. How to Dispense Medicines.—Medicines should *never* be poured out and administered without first reading the label. No matter what degree of certainty may exist that the right medicine is being employed errors are liable to occur, and the most careful people may under some circumstances make mistakes. Accordingly the risk of these errors should be reduced to a minimum by a scrupulous regard for this rule, a failure to adhere to which may cause, as it often has, suffering and death. Again medicines should never be poured out into a cup or glass and allowed to stand, unless proper precautions are taken to prevent the contents of the vessel being mistaken for something else.

Pouring.—In pouring medicine from a bottle into a measuring glass the latter should be held perfectly straight, on a level with the eye, and the medicine slowly poured out from the side opposite the label, in order to prevent soiling the latter by drops running down the outside of the bottle.

Dropping.—In dropping medicines, if a dropper is not available, the lip of the bottle should be moistened by touching it in one spot with the stopper on which is a drop of the medicine. By so tilting the bottle that the moistened part of the lip rests against the side of the stopper at at an angle of about forty-five degrees, the liquid may be accurately and readily dropped out, if the hand is at all steady.

Measuring.—In measuring liquids in spoons, two teaspoonfuls equal one dessertspoonful, two dessertspoonfuls equal one tablespoonful, and four tablespoonfuls one wineglassful. The size of spoons, however, varies considerably, so that they are unreliable for accurate dosage.

Unless directions to the contrary are given it is always safer to dilute medicines freely. A little water added to a dose of medicine rarely diminishes its efficacy, whereas in its pure form it may often be too strong and may do harm.

USEFUL REMEDIES FOR THE HOUSEHOLD.

Number of Remedies.—To be of practical value in the home the number of such remedies to be recommended for use among the untrained must necessarily not be large, nor their nature complex, but such as with ordinary care may be used without risk, and such as with ordinary intelligence may be employed in the most common of the simpler ailments. Accordingly, the following are suggested as fulfilling these conditions. Departure from this schedule may of course be made according as individual preference, experience, and the advice of the family physician may dictate.

LIQUID MEDICINES.

1. Aromatic Spirit of Ammonia, two ounces of.—This is a diffusible stimulant acting quickly as a restorative in cases of fainting or heart failure. Its effect as a stimulant does not last a great while. It should be cautiously held to the nostrils for the patient to inhale, and as soon as he can swallow a half teaspoonful should be given, diluted with a wineglassful of water, care being taken not to cause choking by administering too rapidly. Children may take ten drops at a dose.

It is useful also for the relief of sick stomach and of headache dependent on disordered stomach. It may also be of benefit in coughs, after these have become loose, to aid in expectoration. For this purpose it should be taken every hour or two.

Label.—For faintness, dizziness, nausea and headache.

Dose.—Adults, a half teaspoonful; children, ten drops, well diluted.

2. **Whiskey**, four ounces of.—As a stimulant this acts less quickly than the former, but its effect is of longer duration.

Label.—Stimulant.

Dose.—Adults, a tablespoonful; children, a half teaspoonful, in water.

3. **Elixir of Valerianate of Ammonia**, four ounces of.—This is useful for nervousness, hysterical attacks and nervous headache. A teaspoonful or two may be given every hour until relief is obtained, in a wineglassful of water.

Label.—For nervousness, and nervous headache.

Dose.—Adults, a teaspoonful; children, ten drops, in water.

4. **Syrup of Ipecac**, two ounces of.—This is a safe and efficient emetic when it is desired to empty the stomach of undigested food or to relieve an attack of spasmodic croup. For a child a teaspoonful should be given, to be repeated if necessary in a half hour. Vomiting usually occurs in about twenty minutes without previous nausea and without warning. In dry, harsh coughs, from five to fifteen drops every two hours, aids in loosening the cough and aiding expectoration.

Label.—As an emetic.

Dose.—A tablespoonful for an adult; a teaspoonful for a child. As an expectorant, thirty drops for an adult; ten drops for a child.

5. **Sweet Spirit of Nitre**, one ounce of.—For the relief of slight fever, and to promote the action of the skin and kidneys, this remedy has long been poular in domestic use. It should, however, not be kept a great while as age causes it to deteriorate. An adult may take a half to one teaspoonful in a wineglassful of water and a child from five to ten drops in a teaspoonful of water.

Label.—For fever.

Dose.—Adults, a half teaspoonful; children, five drops.

6. **Essence of Ginger**, four ounces of.—This is serviceable for flatulence and colic. A tablespoonful for an adult or from fifteen to thirty drops for

a child; should be taken freely diluted with hot water, and may be repeated in a half hour if necessary.

Label.—For colic and flatulence.

Dose.—Adults, a tablespoonful; children, fifteen to thirty drops, well diluted.

7. **Paregoric**, two ounces of.—Its most frequent use is for the relief of pain. As it contains opium its use for infants and children should be guarded, and usually only under the supervision of a medical attendant. Nevertheless a few, small doses may be given with safety in such ailments as colic and in diarrhœa, after any undigested substances have been gotten rid of by a number of movements. It is of special benefit in diarrhœa accompanied by pain. An adult may take a teaspoonful in a little water every two hours, a child ten drops or an infant two drops. A dose at the very beginning of a cold will often check it. An irritating cough is also often relieved by moderate doses of fifteen or twenty drops every two hours.

Label.—For pain and diarrhœa.

Dose.—Adults, a teaspoonful; children, ten drops.

8. **Laudanum**, four ounces of.—As this contains a much larger proportion of opium than paregoric, still greater care should be observed in its employment, and whenever it is possible to use the milder preparation, as is usually the case for internal administration, this should be done. Laudanum is, however, invaluable, locally applied, in painful injuries, as bruises, sprains, etc. Equal parts of laudanum and water are useful for this purpose. The dose internally for adults is from ten to twenty drops, and for children two or three drops. It should not be used for infants without the direction of a physician.

Label.—*Poison.*

Dose.—Adults, fifteen drops for pain; antidote, produce vomiting by a teaspoonful of mustard in a cup of warm water. Give hot coffee internally and by injection.

9. **Alcohol**, eight ounces of.—This is useful as an evaporating lotion in headache and sprains, either pure or diluted with an equal amount of water. Sponging the surface of the body frequently with alcohol and water, in fevers, helps to reduce the temperature and adds to the comfort of the patient. In all cases where the patient is confined to bed for any length of time alcohol added to the bath is useful to aid in cleansing the surface and in preventing the patient from taking cold.

10. **Peroxide of Hydrogen**, four ounces of.—This is used as a disinfectant for open wounds. Being non-poisonous it is specially well adapted

for use by non-professional hands. When it comes in contact with blood or pus active effervescence takes place. In sore throat, diphtheria, etc., it is valuable, diluted with an equal amount of water, as a gargle. It should be kept tightly corked.

11. **Camphorated Soap Liniment, or Chloroform Liniment,** four ounces of.—Useful in sprains, muscular soreness, rheumatic affections of the muscles, and as a counter-irritant to the chest in cases of bronchitis.

TABLETS.

The use of compressed tablets has become so universal that a list of convenient remedies in this form is given. They economize space, are inexpensive and often more agreeable to take than liquid medicines. They are conveniently kept in wide-mouthed bottles, each containing an ounce, and provided with screw caps.

1. **Sub-Nitrate of Bismuth,** fifty tablets of, each containing three grains.—This is a non-poisonous and efficient remedy for nausea, vomiting and diarrhœa. As it is tasteless it is easily administered to children, mixed with a few drops of water after crushing it. The dose may be repeated every hour even to young children.

2. **Chalk Mixture,** fifty tablets of.—These are so made that each tablet when crushed and mixed with water represents a teaspoonful of chalk mixture. In diarrhœa, especially of children and infants, this makes an efficient remedy, aiding in the correction of an acid condition of the intestinal discharges. The dose may be repeated every two hours.

3. **Lime-Water,** one hundred or more tablets of.—These are made so that each when dissolved in a teaspoonful of water shall represent a teaspoonful of lime-water, and are used in sick stomach. Added to milk, in the proportion of one or two tablespoonfuls of the prepared lime-water to a half tumblerful of milk, the "biliousness" of which many people complain when taking milk is usually obviated.

4. **Pepsin,** fifty tablets of, each containing five grains.—These are used for indigestion, one being given at each meal time. In the diarrhœa of infants, which is caused by a failure to properly digest their food, this is often markedly beneficial.

5. **Bromide of Soda,** fifty tablets of, each containing five grains.—In headache and sleeplessness from nervous conditions and overfatigue, one of these may be taken every two hours, a child taking half that amount.

6. **Brown Mixture,** fifty tablets of.—These are made to represent a

teaspoonful of the liquid medicine. For coughs of a bronchial character a tablet may be taken every two hours.

7. Sulphate of Quinine, fifty tablets of, each containing two grains.—In malarial conditions one may be taken every three or four hours. As a general tonic one three times a day will be useful. At the beginning of a cold ten grains will often check its progress.

MISCELLANEOUS MEDICINES.

Seidlitz Powders, Twelve.—1. Each dose consists of two powders wrapped in papers of different colors, to distinguish them. One powder of each color is dissolved in a third of a glass of water, separately, the two solutions are mixed and taken while effervescing.

Cases of acute indigestion and acute constipation, and of headache dependent on these conditions, are often promptly relieved by their administration.

Chlorinated Lime.—2. One-half pound of chlorinated lime, commonly known as chloride of lime, in a hermetically sealed package. This is for disinfecting purposes, a solution of it being used in the strength of one to twenty parts, for pouring down the drain-pipes and into the utensils used for receiving the discharges of the patient. If economy of space is not an object a quart bottle of Platt's chlorides or of electrozone will be found more convenient.

Ground Mustard.—3. One-quarter pound can of ground mustard. This is useful as an emetic, from one to four teaspoonfuls being stirred into a pint of warm water. Externally, as a counter irritant, it is employed in the form of poultices, either pure or mixed with two or three parts of flour, to which may advantageously be added the white of an egg. Cases in which there is an excess of blood in the head, usually producing headache, are benefited by a foot-bath, into which a tablespoonful of mustard has been stirred.

Bicarbonate of Soda.—4. Two ounces of bicarbonate of soda. In some forms of indigestion, a pinch of soda taken before meals will be of assistance, whereas other cases are more benefited by taking it after meals. In cases of burns where the skin is not broken, soda applied after moistening the surface often affords relief to the pain. The same may be said of the stings of bees and insects. When the urine is acid, as is often the case in rheumatism, and when there is an irritable bladder, a good-sized pinch of soda in a little water taken every hour will aid in restoring the normal condition.

Chlorate of Potash.—5. Two ounces of chlorate of potash. A saturated solution of this in water is of value as a gargle in sore throat and sore mouth.

Boric Acid.—6. Two ounces of powdered boric acid. This has mild antiseptic properties and is good to dust on open wounds, abrasions, and so forth. A teaspoonful in a cup of boiled water, first mixing it into a paste, before adding the entire bulk of water, is beneficial in mild cases of sore eyes, if dropped into them.

Vaseline.—7. Two ounces of carbolized vaseline. This is also a good antiseptic dressing. In burns and open wounds it is healing and soothing.

Zinc Ointment.—8. Two ounces of benzoinated oxide of zinc ointment. This is soothing and healing, though less antiseptic than the former. In many of the milder forms of skin diseases and as a dressing for open wounds when the healing process is nearly completed this may be used.

Toothache Plasters.—9. One box of toothache plasters. These are small plasters containing red pepper and other ingredients, which are applied to the gum of the aching tooth and often with marked relief.

Implements.—In addition to the drugs and remedies above enumerated there are a number of appliances which should be in every medicine chest, the mere mention of which will in most instances be all that is required:

One pair of sharp scissors about four and a half inches long.

One glass piston syringe, preferably with soft rubber tip, to contain about two teaspoonfuls.

One medicine dropper.

One roll of prepared lint for dressings.

One-quarter pound absorbent cotton.

Six roller bandages, each three inches wide and five yards long, in aseptic packages, obtainable at supply stores for physicians' instruments, or at drug stores.

One graduated medicine glass, marked to indicate teaspoonful, dessertspoonful, tablespoonful and wineglassful.

One box prepared mustard plasters.

One spool adhesive plaster one or two inches wide. Johnson and Johnson's Z. O. plaster is at this writing the best manufactured. To be used only on perfectly clean, dry surface.

One fountain syringe.

One hot-water bag.

One clinical thermometer, self registering.

One bundle of yucca wood, a material for splints. This is prepared in thin strips three and a half by eighteen inches, is a porous light wood, which, when moistened, can be made to conform to any shape desired, and when allowed to dry will retain that shape.

One alcohol lamp or one appliance to rest over the gas fixture for heating liquids.

Accommodation of Medicines and Appliances.—A small cabinet, or a shelf in a closet, or preferably a wooden box, should be provided. If the latter the articles described under implements should be kept in a tray or drawer about four inches deep, the smaller appliances being in a separate section or box.

The medicines should be below the tray, the liquids in one section, the solids in another.

A box about twelve by eighteen inches, inside measurement, and ten inches high will accommodate all the articles described. It should be provided with lock and key, but the latter should be attached to the handle of the chest or be in such an accessible place that it will not be mislaid.

THE TREATMENT OF SIMPLE DISEASES.

A detailed explanation of the diseases which the remedies spoken of are applicable to, has been given under each of their separate headings. For convenience of reference, however, these diseases are tabulated below, with the appropriate remedies for treating them:

Bladder, Irritable.—Bicarbonate of soda; sweet spirit of nitre.

Bruises.—Laudanum and hot water; camphorated soap liniment.

Burns.—Bicarbonate of soda; carbolized vaseline; ointment of benzoinated oxide of zinc.

Colds.—Sweet spirit of nitre and paregoric, a half-teaspoonful of each for an adult, or sulphate of quinine eight or ten grains to check; carbolized vaseline to inner surface of nostrils; if well developed inhale vapor of boiling water in which is a teaspoonful of paregoric.

Colic.—Essence of ginger; paregoric; hot water bag.

Constipation.—Seidlitz powder; enema.

Convulsions.—Mustard bath; enema of warm water and soap suds; follow by tablets of bromide of potash.

Cough.—Tablets of "Brown Mixture;" syrup of ipecac; aromatic spirit of ammonia; paregoric.

Cramps.—Essence of ginger; paregoric; laudanum; hot water bag; mustard poultices or plasters.

Croup.—Syrup of ipecac; hot mustard bath.

Cuts.—Peroxide of hydrogen; adhesive plaster.

Diarrhœa.—Tablets of chalk mixture, of subnitrate of bismuth, or of pepsin; paregoric; laudanum.

Dysentery.—See Diarrhœa; also give small doses of syrup of ipecac.

Dyspepsia.—Bicarbonate of soda; seidlitz powder; tablets of pepsin.

Earache.—Hot water bag; one or two drops of laudanum on a pledget of cotton inserted in ear.

Fainting.—Aromatic spirits of ammonia; whiskey; keep head low, have clothing around neck and waist loose, and give plenty of fresh air. Sprinkle face with cold water.

Fever.—Ascertain temperature by clinical thermometer. 98½ degrees is normal; 99 degrees to 101 degrees is slight fever; above this is marked fever. Use sweet spirits of nitre; if due to error in diet give seidlitz powder; in prolonged fevers bathe with alcohol and water.

Flatulence.—Essence of ginger; elixir of valerianate of ammonia; bicarbonate of soda; tablets of pepsin.

Headache.—Seidlitz powder; tablets of bromide of potash; aromatic spirits of ammonia; elixir of valerianate of ammonia; alcohol locally.

Heart-Failure.—Aromatic spirits of ammonia; whiskey; hot water bag and mustard plasters to extremities; if they are cold treat as in fainting.

Hysteria.—Elixir of valerianate of ammonia.

Kidneys.—To promote action of—sweet spirits of nitre.

Malaria.—Tablets of sulphate of quinine, preceded by small doses of syrup of ipecac to stimulate liver, and by seidlitz powder as a laxative.

Nausea.—See Sick Stomach.

Nervousness.—Elixir of valerianate of ammonia; tablets of bromide of potash.

Poisoning.—Emetic of mustard and warm water or of syrup of ipecac; if extremities are cold, apply mustard plasters and hot water bag.

Rheumatism.—Bicarbonate of soda; camphorated soap liniment and hot water bag in muscular form.

Scalds.—See Burns.

Sick Stomach.—Tablets of lime-water; tablets of subnitrate of bismuth; aromatic spirits of ammonia.

Skin Diseases.—Ointment of benzoinated oxide of zinc; carbolized vaseline; boric acid.

Sleeplessness.—Tablets of bromide of potash; elixir of valerianate of ammonia.

Sprains.—Hot water locally; laudanum and water; later camphorated soap liniment.

Sore Eyes.—Boric acid.

Sore Mouth.—Boric acid; chlorate of potash; peroxide of hydrogen.

Sore Throat.—See Sore Mouth.

Stings and Bites of Bees and Insects.—Local use of bicarbonate of soda, of aromatic spirit of ammonia and of laudanum.

Tonic.—Tablets of sulphate of quinine.

Toothache.—Toothache plasters; a drop of laudanum on a pledget of cotton inserted loosely into cavity if one exists; hot water bag to face.

Vomiting.—See Sick Stomach.

Vomiting—to Produce.—Emetic of mustard and warm water, or of syrup of ipecac.

Wounds.—Peroxide of hydrogen; boric acid; carbolized vaseline.

A MOTHER'S RESPONSIBILITY IN CHILD TRAINING.

"Mothers," remarked the cynic, "are of two classes: those who have preconceived ideas as to how to bring up their children and won't learn, and those who have no ideas and can't learn."

Ignorance of Mothers.—We will probably not all agree to this rather sweeping statement, for most of us are fortunate enough to number among our acquaintances several brave, conscientious women who are true mothers in every sense of the word. But looking the facts squarely in the face, we must admit that there are lamentably few such examples, and that the majority of women are most woefully ignorant on the important subject of child-training.

Occupation of Motherhood.—In these days of skilled labor, a person who desires to teach a certain branch of knowledge will spend several years beforehand in preparation. Women as well as men have learned to their cost that in order to obtain a business position they must be able to perform its duties well. The sole exception to this rule seems to be in the case of motherhood, which, of all the occupations in which a woman can engage, is beyond doubt the highest and the most difficult. Possibly because there is no money consideration attached to her duties, a mother's labor in the bringing up of her children is not generally considered in the light of a profession, and hence a woman rarely hesitates to undertake this difficult task without a previous study of the subject. The disastrous result of this act is felt not only by the child but also by the thoughtless mother, who alone is responsible for the consequences.

Who Are to Blame.—Ungrateful and wayward children have always been looked upon with horror, and unbounded sympathy expressed for the parents in their terrible affliction. All that is very right and proper, provided it is the children and not the parents who are to blame. Unfortunately the latter is too often the case, and the sympathy that is given the father and mother frequently belongs to the unhappy offspring, who are made the innocent victims of someone else's ignorance or wrongdoing.

Children's Rights.—Too few mothers recognize the fact that their children have certain rights which should be respected; that among these rights are a healthy body, a good disposition and an intellectual and moral training. To the extent of her powers a mother should provide these for her child. I emphasize these duties as appertaining to the mother, since it is she and she alone in whom is vested the important office of the education of her offspring. The father provides the funds and may aid and advise his wife, but he can never take her place in the lives of his children.

Children's Imitative Powers.—The most characteristic thing about children is their power of imitation, and this power can be made to serve both a desirable and an undesirable end. Few people realize the extent to which this practice is carried by the average child and the reason for its existence. The child is a stranger in an unfamiliar world and among people of whose customs he knows nothing. There is an undefined prompting which urges him to imitate the acts committed by those around him, and even the words they speak. Finally, by constant repetition, he begins to understand what to him at first was an enigma. In the case of the tiny baby this imitation is unconscious, but finally it is performed consciously.

Children's Surroundings.—The tremendous importance of a child's surroundings will at once be seen. Since he must imitate, it is right that he should see and hear only things worthy of imitation, and herein lies a great difficulty; for people cannot be made to comprehend that what they do and say in the presence of children can have any effect upon their characters. "The child is too young to take it in," they assert. Some day they are startled and embarrassed when the youngster repeats their action and the very words uttered by them, in the presence of strangers. The truth is that children comprehend more than we know, and the ideas which they receive may lie dormant for some time before they are able to give them out. This explains many seemingly incredible acts of memory on the part of very young children.

Dispositions and Temperaments.—Not only do children imitate the words and actions of those around them, but they also reflect in a wonderful degree their dispositions and temperaments. If one or both of the parents are nervous and irritable, the chances are that their offspring will be the same, and, on the contrary, if the family life is peaceful and happy it will be reflected in the sunny dispositions of the children. All these things will be considered by the wise mother who does not wish the little one to enter the great struggle of life with a terrible handicap at the very outset.

Froebel's System.—Friedrich Froebel, the originator of the kindergarten, and the greatest student of child nature that the world has ever known, was the first to see that the education of the child must begin when he is born. It is necessary, therefore, for the mother to understand the nature of the little being whose destiny lies in her hands, and to this end Froebel formed classes especially for mothers where they could be taught the physical, mental and moral requirements of their children. His book of songs and games is intended not only for the kindergarten but for the mother to use with her baby. The mottoes and commentaries on them are for the kindergartner's or mother's perusal. It is a work that all those who have the care of young children cannot well do without.

Start of Child Training.—The question is often asked, "How can a mother start the training of her child when it is yet too young to understand what she says?" If the questioner will but consider for a moment she will realize that the education of a human being begins at the moment of birth, continues throughout life, and only ceases when he dies. Every physician will testify to the necessity of forming desirable habits in the period of infancy, when the character is still in a plastic condition. The foundation for habits of punctuality and self-control are easily laid in the infant by accustoming him to a regular life. His meals should be given at stated periods, also his walks and his bath. He should be put to sleep at the same time every day, and gradually he will learn to know what is required of him and cheerfully conform to it.

Crying Children.—Children should be taught that no amount of crying and misbehavior will bring a coveted object which has once been denied them. A child who has thus been indulged once by a thoughtless parent will practice the same tactics another time. Children learn almost intuitively to connect cause and effect. "I cried for it and it was given to me, so it must be my crying that brings me what I want." And they lay that connection of ideas by for future use. In correcting this, as in so many other things, it is the first step that both counts and costs. There may be a scene or two at the outset when the half-formed will of the child is pitted against that of the mother, but what is that in comparison with the value of the final results in the formation of the child's character. Few mothers realize the harm they can do a child by an unwise lowering of their parental authority.

Over-Indulgence.—Over-indulgences in smoking, drinking and other vices are loudly condemned by all right-thinking people. It is an interesting fact that any number of such cases have been traced directly back to the foolish leniency of the mother in allowing in her child excesses in little things. For example, baby is permitted to suck his finger and soon is not happy unless doing so. Finally, the mother notices the act and straightway provides a rubber-ring or something similar to take the finger's place. The child quickly becomes accustomed to the new device, and when the ring is not forthcoming he sucks his cap-string, or anything within reach. Pencils, chewing-gum and candy take the place of the ring when the baby grows into the boy, and finally these give way to cigarettes when manhood is reached. Is it any wonder that a man finds the tobacco habit hard to break. He has been accustomed to having something constantly in his mouth and with each year the habit grows stronger and his will weaker.

Correction of Overeating.—Eating after the cravings of nature have been satisfied is a common fault in little children, and thoughtless adults will frequently urge them to partake of more food than the stomach can possibly have any use for. This is a fertile cause of ill-health, but far worse than that, it is more injurious to the moral nature. This also applies to the excessive eating of candy and sweet things of which the child is very fond. The continual gratification of the appetite, or in fact of any of the senses, to a point beyond that which common sense dictates can have but one result and that is the loss of all self control.

Children's Pitfalls.—It is far from my wish to discourage any mother in the training of her children by thus pointing out the numerous pitfalls that beset her way. These same pitfalls are many and deep, it is true, but continual watchfulness and a knowledge of wherein the danger lies will do much to keep one in the right path. It is to this in a large measure that the good kindergartner owes her wonderful influence over her small charges. She makes a study of each individual child, his virtues and faults, what he likes and dislikes and in fact all the peculiarities of his individual character. Thus she is enabled to correctly attribute his acts to the motives which prompted them and reward or punish the small doer accordingly. For it is a well-known fact that two children may do exactly the same thing—the one from a bad and the other from a good motive; and a person not understanding the different natures would be likely to treat both in the same manner.

Rewards and Punishments.—The question of rewards and punishments is one of the gravest with which the mother and kindergartner is called upon to deal, for an unjust decision in such a matter is often the cause of much harm to the child. The arbitrator is practically in the position of God to the child who regards her decision as absolutely just and final. One of the saddest things that could happen to a mother is the loss of this faith, and it may safely be said that this loss only comes through her child's knowing that her decisions are unjust. She should be the standard of right and wrong in the eyes of her children, their conscience, so to speak, before their own has completely formed.

Book X.

TREASURY AND HANDBOOK OF HEALTH AND HOME INFORMATION.

QUICK CURES FOR ALL DISEASES.

Cholera Morbus.—Cayenne pepper, ten grains; chalk, one-half drachm; anise, two drachms; add to this a pint of water sweetened with sugar and boil to one-half pint, and give teaspoonful every hour or two until relieved, and apply kerosene oil to stomach and bowels.

Chafing.—Use powdered starch freely after bathing and drying (well) the parts.

Corns.—Apply kerosene oil to part each night. Apply turpentine to part each night.

Biliousness.—Use the juice of half a lemon each morning before breakfast. Boil two ounces of quassia root in one pint of water and strain. Take a teaspoonful every four hours for a week or two.

Bunion.—Apply adhesive plaster to part; put about a teaspoonful of salicylic acid to two tablespoonfuls of lard and apply morning and night.

Backache.—Apply a mixture of one part of turpentine to two parts of sweet oil and apply to back two or three times a day. Apply the same warm.

Abscess.—Make a mixture of equal parts of rosin and sugar, and apply for several days till broken; if not, poultice hourly with flaxseed meal.

Bronchitis.—To a pint of flaxseed tea add the juice of two lemons and about three tablespoonfuls of sugar, and take a teaspoonful every half hour until relieved.

Colic.—Give ten to fifteen drops of asafetida every half hour until relieved. Chamomile tea, a teaspoonful every ten or fifteen minutes.

Painter's Colic.—Give patient a free purge of cream of tartar, about tablespoonful in half glass of water, and apply warmth to stomach and bowels.

Asthma.—Make strong solution of saltpetre and saturate pieces of blotting paper and dry. When a paroxysm is felt ignite a piece of the paper and inhale the smoke. This acts most quickly, alleviating distressing symptoms and shortens the paroxysm.

Bleeding from the Nose.—Inject a strong solution of alum, made with one-quarter teaspoonful of alum to half teacup of water, into each nostril, and place cotton saturated with same to nostril.

Bleeding from the Stomach.—Make a strong decoction of geranium tea, made by boiling about two ounces of geranium root in a pint of water to half pint, and give a dessertspoonful every hour or two until hemorrhage abates.

Sun Stroke.—Apply alternately hot and cold applications to forehead and base of the brain or back of neck; place the feet in warm mustard water, and apply mustard to stomach and calves of legs.

Nausea or Sick Stomach.—Drink a teacup of warm water every few minutes until free vomiting takes place, and apply a small mustard plaster, made with the white of egg instead of vinegar or water, to the pit of stomach, allowing same to remain an hour or two, as no blister will occur.

Cramps in Stomach.—Make mustard poultice, with white of egg instead of water, and apply same to bowels, and give a tablespoonful of blackberry tea, made from root, every fifteen or twenty minutes until relieved.

Hemorrhage of Lungs.—Give patient half a teaspoonful of common salt every hour or two until hemorrhage abates.

Erysipelas.—Put about a tablespoonful of baking soda in one pint of water and bathe parts several times a day. Keep parts well bathed with witch hazel.

Burns or Scalds.—Put a teaspoonful of alum in pint of water, and bathe parts frequently. Keep the parts well wet with this solution, which extracts the heat in a remarkable manner and soothes the patient into a calm and refreshing sleep. Apply a solution of kerosene oil in the proportion of one part of sweet oil and two parts of kerosene oil, and keep the parts well wet with this mixture.

Tonsillitis.—Chlorate of potash, a teaspoonful in teacup of water, and gargle throat frequently. Borax, put quarter teaspoonful in teacup of water and gargle throat frequently.

Croup.—Mix a teaspoonful of alum with the white of one egg, and give a teaspoonful every few minutes until free vomiting occurs. Give one-quarter teaspoonful of syrup of ipecac every ten minutes until free vomiting occurs.

Blood Purifier.—Sarsaparilla tea, a tablespoonful three or four times a day. Cream of tartar, half a teaspoonful night and morning.

Arrest Cough.—Flaxseed tea, a teaspoonful every ten or fifteen minutes. A mixture of lemon and sugar is very efficacious. Take small quantity every ten or fifteen minutes.

Diarrhœa.—Take half ounce of blackberry root and boil in pint of water about fifteen minutes, strain and give teaspoonful every hour or two until relieved; or fluid extract, dose five to ten drops in a little water; or boil about half an ounce of tannin root in pint of milk, about ten or fifteen minutes, and give a tablespoonful every hour or two.

Deafness.—Put about five or ten drops of the juice of onion in affected ear several times a day. If any pain exists, add a drop or two of laudanum, or drop two or three drops of glycerine in ear. In about one hour syringe ear well with warm castle soap suds or warm milk.

Varicose Veins.—Apply witch hazel night and morning, and wear bandage during day.

Blood Poisoning.—Quinine sulphate, one scruple; tincture chloride of iron, one and one-half drachms; syrup simple, two ounces; make mixture and give half teaspoonful four times a day.

Dropsy.—Make a tea or infusion of half an ounce of skull cap root to one quart of water, and boil to pint. Take wineglass of same three or four times a day. Or the same quantity of grapevine root, made in same manner, and taken as above. Also use vapor bath, about a week, each day, and drop one week, again renewing.

Diphtheria.—Give adult one teaspoonful of kerosene oil two or three times a day. For child, from ten to thirty drops, according to age, and apply some to throat. Also make gargle of half teaspoonful of tannin to four ounces or teacup of water, and bathe throat thoroughly several times a day, and apply to throat a strip of fat bacon, with a liberal supply of common salt rubbed on the bacon, and apply the same to throat morning and evening.

Dyspepsia.—Take one teaspoonful of white mustard seed, followed by half glass of water about ten minutes before each meal, or use the yolk of one egg, with small quantity of common salt, before breakfast.

Diabetes.—About one teaspoonful of powdered alum in glass of milk, and drink one-half the quantity about half an hour before each meal.

Dysentery.—Take one ounce of dewberry root and boil in quart of water to one pint, and give half wineglass of same every two or three hours until discharges diminish.

Chilblains.—Apply lime-water to part affected several times a day.

Chapped Hands and Face.—Apply a mixture of one-third glycerine and two-thirds rose water two or three times a day.

Cancer.—Give a tablespoonful of sarsaparilla tea, made with two ounces of sarsaparilla root in quart of water boiled to pint; and apply to cancer growth a poultice made of carrots scraped or mashed cranberries.

Cold Feet.—Make solution of two teaspoonfuls of borax in quart of warm water, and soak feet thoroughly at bedtime, and wear woolen socks for sleeping.

Constipation.—Drink teacup of flaxseed tea each morning before breakfast, and establish regular hour each day for stool. Eat orange each morning; also laxative food, as oatmeal, prunes stewed, and so forth.

Catarrh.—Use as an injection a mixture composed of one teaspoonful of common salt, a teacup of milk and half pint of warm water as injection for nostrils three times a day; or same quantity of borax can be substituted for the salt.

Water Brash.—Give about quarter teaspoonful of common baking soda in wineglass of water after each meal.

Worms.—Make decoction of pink-root tea, one ounce of pink-root to pint of water, and boil to half pint. Give teaspoonful three times a day for two days, followed by purge of castor oil or cream of tartar.

Wen.—A mixture of ten grains sulphate of copper to two tablespoonfuls of water, and apply three or four times a day.

Toothache.—Apply oil of cloves on small piece of cotton and place in cavity of tooth, or rub gum lightly with oil of sassafras.

Tympanites.—Make mixture of one tablespoonful of turpentine to half pint of water, and apply as fomentations, hot as can be borne.

Ulcer.—Make poultice of fresh scraped carrot, and apply to ulcer or sore two or three times a day, keeping parts well cleansed.

Fever Sores.—Make a decoction of clover blossoms, and apply to parts three or four times a day. Half ounce of clover blossoms to one pint of water, and boil about half an hour.

Suppression of Urine.—Boil three tablespoonfuls of watermelon seeds in one pint of water, strain and cool, and give teaspoonful every half hour until relieved.

Scurvy.—Use a decoction of dogwood root, one ounce to pint of boiling water; strain and cool and give tablespoonful four times a day.

St. Vitus' Dance.—Make infusion of black cohosh, one ounce to pint of boiling water; strain and cool and give teaspoonful four times a day.

Putrid Sore Throat.—Make strong decoction of white oak bark, one ounce to pint, and use as a gargle several times a day, or a solution of borax, one drachm to one-half pint of water.

Scrofula.—Make a decoction of walnut leaves, one ounce to pint of boiling water, and give one tablespoonful four times a day.

Ring-Worm.—Make a strong solution of tobacco leaves, and apply to part until it entirely disappears.

Shingles.—Make solution of yerba rheuma, one ounce to pint of boiling water, and apply freely to part several times a day.

Sleeplessness.—Persons so affected will be benefited by the use of a pillow composed of hops, or cup of warm hop tea on retiring.

Small-Pox.—At once give a wineglass of infusion of pitcher-plant, made with one ounce to pint of boiling water, three or four times a day.

Salt Rheum.—Use an astringent wash as alum, tablespoonful in pint of water, and keep bowels opened by cooling medicines, as cream tartar, rochelle salts, and so forth.

Salivation.—Use as a wash for mouth a mixture composed of the tincture of cinchona, four ounces; borax, one drachm; water, six ounces. Wash mouth thoroughly several times a day.

Falling of Palate.—Make a strong decoction of white oak bark, and use as a wash several times a day.

Piles.—Smartweed root, about half an ounce, boiled with two ounces of lard, and apply to piles three or four times a day; or an application of crushed cranberries is very effective; use as a food cranberries freely.

Pleurisy.—Make a decoction of prickly ash bark, one ounce to one pint of boiling water; cool and strain and give tablespoonful about four times a day, and apply poultices hot as can be borne.

Proud Flesh.—Apply to part powdered burnt alum until the flesh is entirely removed.

Rheumatism.—Make use of lemon juice freely. Use decoction of black snakeroot, one ounce to pint of boiling water; a tablespoonful four times a day. Wet cold compress, renewed every two hours, applied to painful joints.

Rupture.—Make poultice of lobelia and stramonium leaves, equal parts, and apply to part; renewing as often as necessary. In the reduction of hernia the use of chloroform is obvious.

Kidney Disease.—Make decoction of sheep-sorrel, one ounce to pint; boil, strain and cool. Give wineglassful three or four times a day. Or the same quantity of buchu leaves, made in same manner, and dose the same, and apply the spinal ice bag to kidneys.

Melancholy.—Use a pill composed of about three grains of asafetida three or four times a day; change of scene; bright surroundings, and so forth, or one grain of musk three or four times a day.

Neuralgia.—Equal parts of tincture of belladonna, tincture of aconite root and laudanum applied to part affected, several times a day. Or make mixture of one teaspoonful of common black pepper, the yolk of one egg, make plaster and apply; renew if necessary.

Polypus.—Apply powdered poke root several times a day. This treatment must be pursued for some weeks.

Night Sweats.—Make a strong infusion of sage tea, and use a tablespoonful three times a day, with double dose at bedtime. Sponging body before retiring with alum or borax water often checks same, and induces refreshing sleep. Apply belladonna ointment at night to chest.

Itch.—Apply kerosene oil, undiluted, to part several times a day. Apply nitrate of mercury ointment to the body.

Inflammation of the Bowels.—Make poultice of flaxseed meal, and put on surface a mixture of equal parts of tincture of aconite root and laudanum, and apply to bowels; changing same every three hours. Perfect quiet. Give no cathartics. Mucilaginous drinks: Gum arabic water, toast water, and so forth.

Inflammation of Bladder.—Make an infusion of pipsissewa root, one ounce to pint of boiling water, and give wineglassful three or four times a day. Keep parts well warm with poultices, and so forth, over bladder. Drink plentifully of hop tea, which is an excellent remedy; also an infusion of cubebs and buchu.

Gall Stones.—Drink about one wineglassful of sweet oil at bedtime, followed in morning by cathartic, as seidlitz powder or cream of tartar, and phosphate of soda, teaspoonful each morning in wineglassful of water. This treatment to be pursued several weeks. Massage the part over the region of the liver lightly night and morning. Gall stones being very painful and dangerous, it would be well to consult page 497, Liver Colic.

Bright's Disease.—Use skimmed milk freely, both at meals and between, and apply soothing fomentations to small of back, as infusion of hops with laudanum, and take acetate and citrate of potash two or three times a day in five- and ten-grain doses.

Nettle Rash.—Make a strong solution of common baking soda, about three teaspoonfuls to pint of water, and sponge or bathe body thoroughly.

Hay Fever.—If much irritation of eyes and nostrils, inject into nostrils, three or four times a day, a mixture composed of ten grains of sulphate of zinc, half teaspoonful of borax, and about four ounces of rose water.

Hoarseness.—A mixture of scraped horseradish, with a small proportion of wheaten flour, use of this a small quantity several times a day. Or the juice of one lemon, with sufficient sugar to saturate, and take teaspoonful of same several times a day, or a small piece of borax dissolved in mouth and swallowed slowly.

Liver Complaint.—Make infusion of dandelion tea, one ounce to one pint of boiling water, strain and cool, and give wineglassful morning and evening. Or use from one to three grains of may apple night and morning for several weeks, followed occasionally by a light purgative, as seidlitz powder or rochelle salts.

Inflammation of Stomach.—Make decoction of hops or stramonium leaves, of either one ounce to pint of boiling water, and foment stomach and bowels several times a day. Apply mustard plaster.

Goitre.—Apply the following several times a day: Extract of belladonna, half drachm; compound ointment of iodine, two drachms; vaseline, half ounce. This treatment must be kept up for several months.

Gleet.—To one ounce of Port wine add about ten grains of tannin, and use as an injection three or four times a day.

Hiccoughs.—Put about quarter of a teaspoonful of cinchona bark, powdered, in two ounces of peppermint water, and give a teaspoonful every five or ten minutes until relieved.

Sick Headache.—Make a strong decoction of hop tea, and take wineglassful every half hour or hour until relieved.

Nervous Headache.—Give about fifteen or twenty drops of the aromatic spirits of ammonia until relieved.

Palpitation of Heart.—Make an infusion of geranium root, half ounce in pint of boiling water; strain and cool and give wineglassful three or four times a day.

Enlarged Spleen.—Give from ten to fifteen drops of fluid extract of Bear's Foot three or four times a day, and apply over seat of enlargement a plaster composed of Burgundy pitch and extract of belladonna, equal parts; also use massage over affected part.

Ague in Face.—Make a solution of teaspoonful of menthol crystals dissolved in two ounces of alcohol, and apply to face several times a day, taking care it does not enter eyes.

Felon.—Apply a mixture of half teaspoonful of powdered camphor to one egg, mix thoroughly, and apply same two or three times a day.

Fistula.—Use as an injection a solution of witch hazel, diluted with water.

Aching and Tender Feet.—Make a strong solution of white oak bark, and soak the feet night and morning.

Gravel.—To one teaspoonful of powdered borax add about two tablespoonfuls of cream of tartar, and add one pint of water; of this mixture take four teaspoonfuls four or five times a day; also give ten grains of the bicarbonate of potash three times a day to dissolve the calculi.

Simple Fever.—Give about half a teaspoonful of sweet spirits of nitre in a little sweetened water every two or three hours for an adult, and less quantity to child, in proportion to age. Keep bowels well open with simple purgative.

Bilious Fever.—Take about ten drops of the fluid extract of wild indigo-root in a little water, once in four hours. After a day or two commence with one grain of cinchonidia. To be taken every three hours.

Scarlet Fever.—Give at outset ten to fifteen drops of sweet spirits of nitre every two or three hours, and apply to throat strip of fat bacon well saturated with common salt. Change same morning and evening and apply each night to body the following: Resorcin, one drachm; vaseline or lard, one-half an ounce, and rub body thoroughly.

Brain Fever.—Give from five to twenty drops of the following mixture every hour or two during the excitement. Tincture aconite root, thirty drops; tincture yellow jassemine, two drachms; sweet spirits nitre, one drachm; simple syrup, two ounces.

Fever and Ague.—Make an infusion of one ounce of dogwood root boiled in one quart of water to one pint; strain and give half wineglassful every two or three hours.

Cold.—Mix ten drops of spirits of camphor with a pint of hot water. Sip the whole of it as hot as it can be taken. Avoid draughts till the free perspiration has carried the cold off.

Rheumatism.—Among the many remedies found effective in rheumatism is rochelle salts. Dissolve a dessertspoonful in water and take every two hours. After twelve hours take once in four hours.

Eczema.—1. Chronic eczema (skin disease) may be treated successfully by an ointment of pitch and turpentine melted together; an ounce of each. Add an ounce of vaseline and two drachms of red precipitate. Mix all well and apply as a salve.

2. A good eczema wash is made of an ounce each of bruised bloodroot and yellow dock, steeped well in a pint of alcohol and half pint of vinegar.

3. A paste of sulphur and lard applied to the affected skin morning and evening is recommended as a good eczema cure.

Sore Throat.—Hardly any remedy for sore throat proves more efficacious than the old-fashioned plan of tying around the throat a slice of fat bacon on which is sprinkled black pepper.

Erysipelas.—Boil white navy beans, mash and add cornmeal to make poultice. Apply hot and change frequently.

Indigestion.—An exclusive diet of fruit for several days is found efficacious in most cases of indigestion. This diet is excellent in dyspepsia and constipation.

Insomnia.—On going to bed, take some sound, as a clock-tick or the breathing of some one within hearing, and breathe long full breaths, keeping time to the sound. In a very short time you will fall asleep, without any of the painful anxieties attending insomnia.

Croup.—Fat bacon applied to the throat, as in sore throat, is recommended as a remedy for croup. Its action can be helped by taking internally a few drops of kerosene oil on sugar.

Nervous Headache.—A cloth wet with spirits of camphor and sprinkled with black pepper when applied to the head, gives relief.

Appendicitis.—To allay the pain and stop the formation of pus in appendicitis it is recommended that the flannel cloth be saturated with hot water, wring it out, drop ten to fifteen drops of turpentine upon it and apply it to the afflicted parts as hot as the patient can bear. Repeat till relief is obtained. Then cover the bowels with a thin cotton cloth, upon which place another cloth wrung out of kerosene oil. This sustains the relief and conduces to rest and eventual cure. It is an essential part of the absorbent cure for appendicitis, and since its adoption doctors do not resort to a surgical operation half so often. A liver pill should be used and taken every few nights at bed-time.

2. Dr. Wm. W. Myers says that root of wild yam is a good remedy for appendicitis; one ounce to a pint of water, boiled down to a half-pint. Take a teaspoonful every hour until relieved, and then every two hours until cured.

Neuralgia.—Make a tea of the root of twin-leaf and take a wineglassful three or four times a day. Or, if the tincture is used, take two or three teaspoonfuls. This is recommended by many as affording entire relief in the most severe cases of neuralgia.

Whites (Leucorrhea).—Cleanse the parts effectually with warm water, by means of an injection. Then inject a full syringe of a mixture made by dropping a tablespoonful of extract of witch hazel (Pond's is best) into warm water.

Suppressed Menses.—A capsule of cayenne pepper—five grains—is recommended as a remedy for suppressed menses. It should be taken on or about the period the menses is expected. For regulating the menses the insertion, before retiring, of a five-grain capsule, composed of two ounces of baking soda and two drachms of citric acid is highly spoken of.

Ring-Worm.—The application of kerosene is a good remedy for ringworm. Apply several times a day by rubbing it in well with the finger or a rag.

Quinsy.—Those who have tried oil of peppermint, applied externally to neck and throat, pronounce it an excellent remedy for quinsy. A gargle of kerosene, and an application of the same to the throat by means of a wet cloth, saturated, repeating every two or three hours, is also highly recommended.

Membranous Croup.—Give the patient a warm bath. Put a small piece of quicklime in a little water in a pitcher and place it so that the patient can breathe the fumes. Do this at quarter hour intervals. The inhalation of the fumes from a cloth saturated with a mixture of salt and vinegar is said to be equally effectual.

Diabetes.—In this disease there is an excessive flow of yellowish, sweet urine, with frequent calls to void it, and an excessive flow.

Treatment.—**1.** A tea of water-hoarhound, drunk freely, is an excellent remedy. Or, in place of the tea, a teaspoonful of the tincture may be taken four or five times a day.

2. A tea of common chickweed, drunk freely for sometime, is also mentioned as an excellent remedy. Salicylate of soda in five-grain doses is most efficacious.

3. A purely milk diet, in copious quantities, has been found to result in a cure.

4. A favorite remedy of Dr. Myers is an ointment made of one drachm of veratria and one ounce of simple cerate. This is applied by rubbing on the spine morning and evening.

5. A preparation of three grains of tannic acid and fourth of a grain of opium, taken before meals and at bed-time, is said to be a good remedy; also valerianate of ammonia in two-grain doses is very effective.

Ulceration of the Womb.—1. The symptoms of pain, soreness and smarting at the neck of the womb yield to an injection of alum water, twice a day. The solution should consist of a third of a teaspoonful of powdered alum in a pint of water.

2. Fluid extract of white pond-lily, in doses of ten to fifteen drops, three times a day, has been recommended as an excellent cure. The same effect follows injections of an infusion of the plant, two to three times daily, at the same time drinking teacupful doses of the infusion three times daily.

3. An infusion of golden seal, used two or three times daily as an injection, proves efficacious.

4. An infusion of oak-bark, used as an injection twice a day, is found very curative. If tannic acid be applied directly to the affected part, a like result is reached. A strong solution of tannic acid in collodion is very effective, or sulphate of zinc with warm water as a wash.

Sleeplessness.—Hops in the form of a pillow on which to sleep, is given as a cure for wakefulness.

Hop Remedies.—Hop fomentations and poultices are excellent to relieve pain and inflammation. The yellow powder of hops, in doses of ten to fifteen grains, allays the pain of gonorrhea and chordee. It settles nervous irritation of almost any kind, especially that of delirium tremens. A decoction of hops is found to be a cure for sick headache. A tea, drunk freely, is a remedy for kidney complaint.

Onion Remedies.—Onion syrup, prepared by sprinkling sliced onions with sugar, and taken in teaspoonful doses every fifteen minutes, until relief is obtained, is a favorite home remedy for croup. Free use of onions on the table is a preventive of constipation. An application of crushed onions to burns, extracts the fire and relieves the pain. In bronchial affections onions afford a remedy, in the form of a syrup, taken in teaspoonful doses, three or four times a day, or oftener if the case be severe.

Celery Remedy.—To cure rheumatism, drink freely of celery tea, three or four times a day. It should also be used freely as an article of diet. Officinal preparations of celery can be had at the drug stores.

Peppermint Remedies.—Essence of peppermint, a teaspoonful to a tumbler of hot-water, sipped occasionally, is both a preventive and cure of seasickness. Bruised and applied to the stomach it relieves nausea and vomiting.

Tomato Remedy.—Tomato syrup, made of peeled tomatoes well sweetened with sugar, taken in teaspoonful-doses every half hour, is recommended as a remedy for cholera infantum.

Grapevine Remedies.—The ashes of the grapevine are recommended by some eminent authorities as a cure for dropsy. The inner bark is burned to ashes, and a teaspoonful taken three times a day in a glass of wine. Various grape remedies are found effective in dysentery of chronic form.

Camphor Remedy.—A favorite remedy for colds. Drink, as hot as can be borne, a pint of water mixed with ten drops of spirits of camphor.

Lockjaw.—Apply a warm poultice of flaxseed meal, saturated with laudanum and sugar of lead water, to the jaws and neck.

Stings of Insects.—Apply hartshorn or water of ammonia to part, which neutralizes the formic acid, the active principle of the poison.

Offensive Breath.—Teaspoonful each of powdered myrrh and camphor and put in pint of water; use as a wash for mouth.

Inhalation of Noxious Vapors.—Remove patient from influence; place in open air; put two tablespoonfuls of turpentine in quart of boiling water and inhale vapor to counteract the deleterious effects of the poisonous gas.

For Regulating the Menses.—For regulating the menses take half a teaspoonful of tea of smartweed or tansy before going to bed, and continue daily till relief is had. To aid the remedy bathe the feet in hot mustard water. A warm injection of chamomile tea before going to bed will give almost instant relief.

For Painful Menstruation.—Let patient take an active cathartic; then, when put to bed let half a cupful of hop tea be given, and a douche of one quart of hot water, into which ten drops of laudanum have been dropped, be injected.

For Chronic Disordered Stomach.—Take as much powdered burnt alum as will go on the point of a penknife blade and place dry on the tongue three or four times a day.

Itching of Anus.—Make a solution of five to ten grains of borax to the ounce of hot water and apply freely to the anus.

Diabetes.—Five grains of the salicylate of soda taken three times a day—a specific cure.

Diarrhœa.—An infusion of chamomile, prepared by steeping four to six heads of chamomile flowers in a cup of boiling water for an hour, and giving a teaspoonful hourly.

Cold Feet.—The ice bag, by increasing the flow of blood to the legs, relieves the coldness of the feet.

Constipation.—Drink glass of cold water before and eat orange after breakfast each morning.

Scurvy.—Vinegar and fresh vegetables.

St. Vitus' Dance.—Apply ice to spine, which relieves muscular tension.

Scrofula.—Sulphide of lime in ten- to fifteen-grain doses, given in milk after meals, is most efficacious.

Shingles.—Apply morning and night an ointment prepared from the oleate of mercury.

Small-pox.—An infusion of the plant actea racemosa; one ounce to a pint of boiling water. Tablespoonful every three hours will prevent pitting. Cold packing is beneficial.

Piles.—A cold water injection of about half a pint every morning before going to stool cures in many instances. In bleeding piles use injection of witch-hazel. Rhubarb is most efficacious, a piece of about ten grains to be chewed or dissolved in the mouth nightly.

Sick Headache.—Aconite ointment rubbed over painful brow, or aconite liniment will cut short the pain. One drop of the tincture of nux vomica in a teaspoonful of water every five or ten minutes will quickly relieve.

Enlarged Spleen.—Give quinine and the tincture of the chloride of iron—one-half grain of quinine and ten drops of the tincture of iron—three times a day, and apply morning and night over the enlargement the compound iodine ointment.

Rheumatism.—Acid steam bath is most effective. Cold, wet compress applied to painful joints. The bicarbonate and citrate of potash in doses of five or ten grains each three or four times a day. Drink freely of lemonade.

Eczema.—If the secretion is profuse apply powdered cinchona bark; also a mixture of glycerin, two parts to one of borax. A cold potato poultice, with a small quantity of camphor, has proven most beneficial.

Erysipelas.—A wash containing two parts of borax to five of water is effectual in subduing inflammation; also an ointment of three grains of morphine, two drachms of green vitriol and one ounce of lard, applied several times a day.

Neuralgia (of Face).—Use aconite liniment, care being taken that it does not enter the eys. An infusion of capsicum pods, one handful to a pint of warm water, and applied on lint is most efficacious.

Whites (Leucorrhea).—An infusion of hydrastis or yellow root, when there is much secretion, being effective. One drachm of bicarbonate of potash to a pint of water is most useful as an injection. Vaginal injections of cold water are useful after it has been stopped, to prevent its recurrence.

Suppressed Menses.—Hot sitz bath with mustard a few days before the period. Ice applied to the lower portion of the spine increases the amount of blood supplied to the pelvic organs and restores the monthly flow.

Quinsy.—In inflamed tonsils, when they almost meet, mercury and chalk (or gray powder), the third of a grain every hour, acts like magic. Cold compress used nightly to harden throat. A teaspoonful of the tincture of cayenne pepper to half a pint of water is a useful gargle.

APPENDICITIS.

The appendix is a malformation of the large intestine attached to the internal part of the cecal sac, a large fluid intestine closed at one end. It is a useless organ, but at the same time one essentially injurious.

Causes.—If a retention of its contents (through any external cause) takes place the most favorable conditions are present for their decomposition and the development of bacterial infection. In this manner excess in eating, violent exercise after meal and a continued arrest of fecal matter prove most harmful.

Constipation produces a defective secretion and a sluggish contraction of the muscular coat of the appendix, manifesting itself by dull pains in the belly, and irregular stools. This condition is the most frequent cause of hardened dregs or sediments. Indigestion is also a frequent cause.

Symptoms.—There are several symptoms of the first attack of appendicitis. A person of habitually good health, or suffering for some time from vague digestive troubles, is suddenly taken with a severe pain in the right side of the abdomen between the ribs and the hip. The pain is accompanied with colicky paroxysms more or less violent, followed or not by one or two attacks of vomiting of food or bile. Colic will eventually subside and fixed pain continue, sometimes exactly limited to this point, or it may spread over the bowels, the muscles of the region becoming hard, with little fever.

After careful research and successful experiments we have scientifically compounded the following pills which will prevent and cure appendicitis. It keeps the stomach, bowels and bladder clean and pure. It dissolves and eliminates uric acid deposits and fecal concretions. It allays inflammation and allows no accumulation of fecal matter about the appendix.

Severe Attacks.—The treatment of the attack proper consists of absolute quiet, both general and of the intestines. The pain and general indisposition will compel the patient to go to bed and assume a position where the abdominal muscles will be as much relaxed as possible. Avoid abdominal movements, such as sneezing, coughing, and so forth. The diet should at first consist of only small quantities of cold or lukewarm milk, oatmeal, bouillon from white meat, and so forth; avoid sweet and starchy foods.

Aloin	15 grains
Cascarin	15 grains
Podophyllin	10 grains
Extract of belladonna	7 grains
Strychnia	1 grain
Gingerne	7 grains

Make into sixty pills. Take two pills at first dose, and then one pill every two or three hours until relieved.

This pill will regulate the bowels; all drastic cathartics must be avoided. It removes all gases, sweetens the stomach and aids digestion. Prevents attacks of appendicitis and surgical interference. It dissolves all concretions and deposits. Increases the healthy action of the bowels. Vegetable purgative not required. It affects directly the appendix. Relieves all pain and inflammation. Stops all incipient cases.

PILES.

Causes.—Piles are due to constipation, difficult stools, sedentary habits, and some forms of liver complaint.

Symptoms.—They consist of little tumors which form at the edge, or just inside of the fundament, and give rise to intense pain, especially during evacuation. Very often their surfaces exude blood, in which case they are called "bleeding piles." When seated at the edge of the fundament they are not apt to bleed, and are called "blind piles."

Treatment.—**1.** When small, an ointment of ten grains of extract of belladonna, thirty grains of tannin, and twenty grains of powdered opium, will generally relieve them. When large, protruding and very stubborn and painful, apply a solution of cocaine to the parts affected. Then gently press the tumors back into the rectum. The swelling will gradually diminish and the pain subside.

2. A strong solution of salt injected two or three times a day has been found efficacious. The solution is to be weakened to suit the conditions of each particular case. Inject half a pint of cold water before going to stool each day.

3. Some recommend the simple extract of Canada Pine (Pinus Canadensis) as a cure. It is applied by rubbing it on with the finger, two or three times a day.

4. Calomel, half a teaspoonful, well beaten into lard, and used as an ointment, two or three times daily, is spoken of as an excellent cure. A lead plaster applied to back is very efficacious.

5. In some places cranberry juice is said to be used with good effect. It is used in the ordinary cooked form and eaten freely as a sauce.

6. An ointment of white lead and linseed oil, well mixed and applied twice a day, has produced some very effectual and rapid cures.

7. An ointment of tannin and glycerine, well mixed and applied once or twice a day, is a favorite remedy with some medical men.

Auxiliary Treatment.—Avoid all liquors, tea, coffee and highly spiced foods. Take exercise. Bathe the parts frequently with cold water. Injections for the purpose of securing easy stool are of benefit.

WORMS.

Take a wineglassful of vermuth and mix it with twenty-five seeds of the pumpkin, add water and boil as in making tea. Drink a teacupful of the tea three times a day for two to three weeks. This is the celebrated Kneipp cure for worms as practiced at his sanitoriums in Germany, and is always found effectual. Another valuable remedy is pink root and senna, one ounce of the former and four drachms of the latter, steeped in a quart of water. Dose, two tablespoonfuls twice a day.

GRAVEL OR STONE IN BLADDER.

Causes.—When the system is healthy the ingredients which form gravel or stone are carried off by the secretions without difficulty. But when there is excess of uric or any other acid these particles unite and gradually grow to the proportions of stone, which may find deposit in the kidneys, bladder or gall ducts, and produce great inflammation and pain.

Symptoms.—Small gravel stones may pass off with the urine, sometimes with great pain, others remain to grow into stone. When the gravel or stone is too large to pass through the urethra the patient is subject to terrific spasms of pain, in groin, kidney, testicle, thigh, abdomen, but generally pointing to the direction in which the stone seeks an exit; nausea and vomiting sometimes set in, and the pulse becomes weak and complexion pale. The patient is rendered uneasy by frequent desires to pass urine.

Treatment.—1. Treatment of gravel in the acute form comprises the warm bath, suppositories of a grain of opium and one-sixth of a grain of belladonna, flaxseed tea, and the use of salty purgatives.

2. In chronic gravel teas or fluid extracts of buchu are often used, and in stubborn cases five-drop doses of diluted nitromuriatic acid, or salicin in five-grain doses, thrice daily, may be given.

3. Some recommend onion juice for gravel, in doses of a wineglassful morning and evening.

4. Relief is sometimes had from a mixture of two teaspoonfuls of powdered borax and five of cream of tartar, dissolved in a pint of water, the dose being two or three dessertspoonfuls four times a day.

5. The juice of the garden beet, boiled to a syrup, and taken two to three times a day in doses of a wineglassful, is said to have valuable curative efficacy.

Auxiliary Treatment.—As already mentioned, a palliative of the spasm of pain is a warm bath or a wrapping of the patient in a blanket saturated with hot water. Keep the blanket hot by frequent applications of the water.

SCARLET FEVER.

The nature of this disease and its treatment will be found under Diseases of Children. But it may be mentioned here:

1. That the external use of fat, raw bacon, is highly recommended as a remedy. The diet should be kept low and cooling drinks freely taken.

2. Another remedy is a tablespoonful of brewer's yeast in three tablespoonfuls of sweetened water, taken three times a day. Half the quantity for children.

3. The remedy recommended by Dr. Myers is:

R.—Tincture of aconite root	25 drops
Salicylic acid	1 drachm
Simple syrup	2 ounces

A teaspoonful every two or three hours.

Or,

R.—Sweet spirits of nitre	1½ drachms
Tincture of belladonna	30 drops
Simple syrup	2 ounces

Take as in above recipe.

4. Some doctors use a gargle in connection with the bacon remedy. It is composed of one teaspoonful of cayenne pepper, two teaspoonfuls of salt and half a pint of boiling water. Strain and add half a pint of vinegar. Gargle the throat frequently with this mixture and take inwardly in teaspoonful doses every hour for adults. Reduce the quantity for children and regulate according to age.

LA GRIPPE.

1. Small pills made of asafetida, and taken three times a day are recommended as a remedy for the grippe. Actea racemosa has been used with great success in doses of twenty drops of the tincture every three or four hours.

2. Some use a tea of red pepper, or of cayenne, with great success. The dose is a tablespoonful in a cup of hot water, drank slowly, before each meal and on retiring. Larger doses in proportion to the intensity of the disease. Sponging the face, temples and neck with water as hot as can be borne relieves the headache of grippe.

RECTAL INJECTIONS.

An elastic-ball syringe, capable of holding the whole amount of fluid to be injected at one time, with a fine elastic pipe, is the instrument that should be used. The pipe previously warmed and lubricated with oil or fresh lard, should be gently introduced into the bowel with hardly any pressure, but allowing it almost to find its own way in for about one and a half inches, in a direction inclining very slightly to the left side of the body. Then with one full and gradual compression of the syringe the whole amount of the contained fluid should be injected into the bowel, and the instrument then be slowly and easily withdrawn. The amount of fluid to be injected for an infant is about two tablespoonfuls; for a child from one to five years, six tablespoonfuls; and from five to ten from eight to twelve tablespoonfuls.

Care with Injections.—The too frequent use of injections is not good; the muscularity and tone of the bowel is thereby relaxed and a feeble and sluggish action induced.

Purgative Biscuit.—A good purgative biscuit is made as follows:

Powdered jalap, one teaspoonful; flour, eight tablespoonfuls; sugar, twelve tablespoonfuls; powdered ginger, half teaspoonful; make twelve biscuits; one may be eaten once or twice a day according to effect desired. For children three years old and infants one-third the quantity.

A Simple Laxative.—A simple method is to take a tablespoonful of tincture of aloes and two tablespoonfuls of soap liniment; mix and rub over the bowels daily for five minutes, when regularity of action will be produced.

Soap Injection.—Cut a piece of yellow soap two or three inches long and of the thickness of the little finger, making the same pointed at one end. If this is introduced into the bowel and held there for a few moments it will produce a good evacuation. A camel's-hair brush, dipped into glycerine, and introduced into the bowel is often most effective in producing an evacuation in a few moments.

EXCESSIVE MENSTRUATION.

Remedy—1. The juice of one lemon taken three times daily will stop excessive menstruation when all other remedies fail, and regulate the system preparatory to the next flow.

2. Tea of comfrey root boiled in sweet milk and drank in half-teacupful quantities three times daily will check menses when too profuse. Sucking the juice of one or two lemons is a valuable remedy for excessive menstrual flow.

LEUCORRHEA OR WHITES.

Remedy—1. Oregon grape-root has been recommended as a curative of leucorrhea or whites. Make a strong decoction by boiling an ounce of the root in a pint and a half of water down to one pint. Take a wineglassful four times a day.

2. A decoction of common tea, used as an injection twice daily, is found very beneficial.

3. Cleanse the parts effectually with warm water by means of an injection. Then inject a full syringe of a mixture made by dropping a tablespoonful of extract of witch hazel (Pond's is best) into warm water.

4. Yarrow-root tea, in doses of a teacupful three times a day, gives effectual relief.

CONSTIPATION.

Remedy—1. A tea made of slippery-elm and drunk in half-teacupful doses several times daily, will alleviate constipation, or in excessive cases an enema of the same will give instant relief.

2. Take two teaspoonfuls of flaxseed and pour over it a cup of boiling water. Strain and drink half a teacupful every morning before breakfast.

FALLING OF THE WOMB.

Remedy.—A mild infusion of white-oak bark, or of alum, or of tannin, used in quantities of a pint as a douche, will often give immediate relief. Peach leaves, mullein leaves and hops made into a tea and used twice a day as an injection often cures when other remedies fail.

CARBUNCLES.

Symptoms.—They generally appear on the back, or back of the neck in the form of hard, heated swellings, accompanied by a burning sensation and throbbing pain. The skin assumes a purplish hue. After a few days suppuration begins, and perhaps from one, two or three different parts. The first, or outer, suppuration resembles that of a boil, but there is at the base a hard, gristly core which requires considerable pressure to squeeze out. If large, or numerous, they are accompanied with high fever, or delirium may set in, attended with great prostration or even death.

Causes.—As they seek a spot where vitality is least active, so they proceed from a debilitated condition of body and disordered blood, such as follow chronic diseases, fatigue, or change of habits of life.

Treatment 1. To draw or ripen them, a poultice of poppy leaves is very efficacious.

2. Equally effective is a poultice made of sassafras root and slippery elm bark, boiled together, and the decoction thickened by stirring in corn-meal.

3. Linseed and slippery elm decoction, mixed with a little charcoal and yeast, used as a warm application, or lotion, seems to lessen pain and inflammation.

4. Carbuncles which head slowly should be opened with a knife, not by sticking, but by two transverse incisions. Menthol ethereal solution, 10 to 50 per cent., applied by camel's-hair brush, aborts boils, carbuncles and inflammatory gatherings.

HIVES.

Causes.—These irritating visitations, generally upon children, are mostly due to indigestion, or partaking of certain disagreeing foods.

Treatment 1. To allay itching, rub with flour; buckwheat is the best.

2. Sassafras or saffron tea is a good internal remedy, since it promotes perspiration and lessens irritation.

3. Bathing with diluted vinegar is a good treatment.

4. Tea of the common nettle, or a tincture of same taken in six-drop doses three or four times a day, is an efficacious treatment.

CROUP.

A most insidious and sometimes fatal affection if treatment is not immediately applied. Turpentine stupes applied to front of throat and breast have proved most effective, saving many lives thereby. The stupes should be made with one-third turpentine and two-thirds water, as hot as can be borne, and apply the same on flannel cloths every few moments until relief is obtained. It quickly acts upon the breathing tubes, cleaning them out, and enables the little sufferer to breathe easily, clearly and with safety.

VOMITING.

A distressing and harassing affection, induced by various causes. But, no matter what the cause, mustard applied as follows is the sovereign remedy. A mustard plaster, made with two or three teaspoonfuls of common mustard, with the white of one egg (don't use water or vinegar in mixing the mustard), and apply the same to front of throat and directly over the pit of stomach, will quickly relieve the most obstinate case of vomiting, caused either by biliousness, nervousness, indigestion, and so forth.

TOOTHACHE.

A most painful affection caused by cold or decay of teeth affecting the nerve which supplies the same. Almost immediate relief can be obtained by making pressure upon the root of the nerve just below the temple, opposite the centre of the ear. Quick relief is also obtained by placing a drop or two of oil of cloves upon a small piece of cotton and introducing the same into the cavity of the affected tooth. The parts should be kept warm either by application of a poultice with a little laudanum added or by means of the water-bag.

NEURALGIA.

An affection of the nerves, causing at times most excruciating pain and suffering. Cold is its most frequent cause, although it may sometimes arise from disease of the sheath or covering of the nerves. Its most frequent seat is in the fifth pair of nerves which supplies the head, face, arms, and so forth. A quick method of alleviating the same is to make pressure upon this nerve at its origin, just over and below the temple. Great relief is obtained by warm fomentations, especially one made from the leaves of the eucalyptus plant. The fomentation is made by adding about one and a half ounces of the leaves to a pint of hot water, and apply fomentations of same to part until relief is obtained.

FELONS.

Symptoms.—These painful inflammations usually occur on the fingers or hands. They are seated at the bone and begin with throbbing pain and great soreness and inflammation.

Treatment 1. A good drawing poultice is made of brown soap and unslacked lime, into which a little alcohol has been introduced.

2. The white of an egg and salt make an application which sometimes serves to scatter the inflammation.

3. Spinal cord of a beef is efficacious in curing a felon.

4. Immersing the afflicted finger or hand in diluted lye will serve to diminish pain and inflammation, and if repeated frequently may eventuate in scattering the felon.

LIGHTNING STROKE.

Place the victim in a current of fresh air, dash cold water on face and chest; if body be cold use lively friction with hands or flannel. Manipulate arms and use artificial respiration as in drowning cases. (See Drowning.) If revival ensue give stimulants—whiskey, spirits of ammonia, a teaspoonful of the former every few minutes, or twenty drops of the ammonia in a tablespoonful of water. An electric current from a home battery applied to spine and back part of the head is useful, before signs of life appear. Means for the recovery of one stricken with lightning should not be discontinued till at least an hour has elapsed after the visitation, as many supposedly fatal cases have been returned to life.

BAKING CURE FOR RHEUMATISM.

The application of hot dry air as a therapeutic agent is regularly practiced in an increasing number of cases of gout, rheumatism, inflammation, obesity, enemia, and all forms of pain.

The patient is placed in a specially devised oven which covers the entire body except the head, and it is said that a temperature of 400 degrees Fahrenheit can be borne without danger. Sips of cold water are given during the process. It is claimed that persons have been able to walk after years of affliction with deforming rheumatism, and in certain cases chronic forms of disease have been cured.

CONSUMPTION—ELECTRICAL TREATMENT OF.

In St. Luke's Hospital, New York City, is (1901) being tested a method of treatment of consumptives, devised by Francisque Crôtte, a Frenchman.

Antiseptic medicines—such as formaldehyde—are driven into the system by means of static electricity, a sponge electrode, saturated with the medicine, being applied externally over the location of the diseased tissue. At the same time other medicaments are inhaled. The use of electricity in this manner is not new, but M. Crôtte has made advances in its practical application. He claims that his treatment will cure every case of consumption in the first stages of the disease, 75 per cent. in the second stage and 30 per cent. in the third or so-called "hopeless" stage.

OIL TREATMENT FOR APPENDICITIS.

The recent treatment and cure of Count Castellane, of Paris, of a severe attack of appendicitis without the use of surgery, and the general acceptance of the treatment of this disease without the use of the knife, except in extreme cases, has led Surgeon-General Terry, of Pennsylvania, to say that the oil treatment of the disease, in connection with the use of a compress, will in almost every case result in a cure if applied in time.

A Case in Point.—A student of Princeton College was stricken with appendicitis. The local physicians declared the case to be one requiring the use of the knife. Dr. Terry was called in. He found the patient's pulse at 120 and temperature at 104 degrees. He immediately administered his oil treatment and compress. Within an hour relief was observed, and by next morning both temperature and pulse had fallen. Within two days the patient was removed to his home, where full and speedy recovery came about.

NEW SALT REMEDY FOR SUNSTROKE.

Symptoms.—Throbbing in head, violent thirst, great restlessness; headache and fullness as if head would burst; red face, increased action of heart.

In extreme cases of sunstroke, where the patient is often in an unconscious condition, with a very weak, rapid pulse, and at times almost imperceptible, the injection under the skin of the forearm of a sterilized salt solution into the vein has been found most efficacious, and has been the means of saving many patients when the temperature has reached 109¾.

Treatment.—A vein of the arm is opened precisely as in the manner for bleeding, and a solution made by approximating one teaspoonful of common salt dissolved in one quart of water. This solution to be of the temperature of the blood, viz., 98⅖ Fahrenheit.

By pursuing this treatment the blood-vessels are filled, the rapid action of the heart diminished, pulse becomes stronger and regular, and in association with the regulated cold bath or cold applications to the surface of the body, consciousness is restored within a very few hours. Care should be taken that the treatment, especially the cold bath, is not applied to cases of heat exhaustion, where the temperature is frequently subnormal. There is no doubt but what this recently instituted treatment by salt injections has been the means of saving many patients who have been affected with sunstroke. In sunstroke the fluid in the blood-vessels being below the normal quantity, the salt injection supplies the place of the lost pabulum. The above remedy is a new discovery made in July, 1901, by the Medico-Chirurgical Hospital, of Philadelphia.

ONE DOZEN GOOD REASONS WHY A BOY SHOULD NOT USE TOBACCO.

1st. Cigarettes or tobacco in any form hinders the growth and injures the nerves and health.

2d. Cigarettes foster the tobacco habit, and may make any boy a slave to it.

3d. The cigarette habit does not help a boy in his life work, and may prevent him from obtaining a good position in business.

4th. Most all reliable business establishments refuse to employ boys who smoke cigarettes.

5th. The following are among the poisons and drugs used in the manufacture of cigarettes: Arsenic, Creosote, Nicotine, Opium, Saltpetre, Tonca flavoring and Rum, all of which are harmful.

6th. Cigarette smoking makes a boy dull and stupid, impairs his memory and prevents his advance in school.

7th. Smoking creates an unnatural thirst, which may lead to drinking intoxicating liquors.

8th. Smoking is a selfish habit which may cause annoyance, discomfort and distress to others.

9th. Tobacco affects the eye, ear and nose, or sight, hearing and smelling, and also the heart.

10th. It costs more than most boys can afford to pay to have their nerves and health ruined.

11th. Smoking is a useless and expensive habit and always does harm in a greater or less degree.

12th. It is also a filthy habit and defiles the body, and anything that defiles or injures the body is a sin against God, who created man in His own image.

TABLE OF WEIGHTS AND MEASURES USED IN THE PREPARATION OF MEDICINES—DOSES AND SO FORTH.

SOLID.			LIQUID.		
60 grains make	1 drachm	ʒi	60 minims make	1 fluidrachm	fʒi
8 drachms make	1 ounce	℥i	8 fluidrachms make	1 fluidounce	f℥i
16 ounces make	1 pound	℔	20 fluidounces make	1 pint	Oi

It is always better to measure by minims than by drops. The size of a drop is constantly variable, while that of a minim, being measured by a graduated glass, is always the same. A fluidrachm is equal to a "teaspoonful," and a fluidounce to two "tablespoonfuls."

Suppose the dose for a child one year old is one teaspoonful, drachm, minim or grain. Then the dose for a child

2 years old is 1½ teaspoonfuls, drachms, minims or grains.
3 years old is 2 teaspoonfuls, drachms, minims or grains.
4 years old is 3 teaspoonfuls, drachms, minims or grains.
5 years old is 3½ teaspoonfuls, drachms, minims or grains.
6 years old is 4 teaspoonfuls, drachms, minims or grains.
7 years old is 4 teaspoonfuls, drachms, minims or grains.

And for a child between seven and fourteen years old it is from four to six teaspoonfuls, drachms, minims or grains, according to age.

For example: Suppose the dose of some prescription is stated to be two tablespoonfuls for a child twelve years old, but it is required to be used for a child four years old. A child twelve years old would take about six teaspoonfuls to every three that should be taken by one four years old, or in other words, twice as much; therefore, the dose to be given is one tablespoonful.

A teacup contains about	4	fluidounces	f℥iv
A wineglass contains about	2	fluidounces	f℥ii
A tablespoon contains about	½	fluidounce	f℥ss
A teaspoon contains about	1	fluidrachm	fʒi

TABLE FOR REGULATING THE DOSES OF MEDICINE FOR CHILDREN.

Take the dose for an adult as one teaspoonful:

1 year old	dose 5 drops
2 years old	dose 7 drops
3 years old	dose 10 drops
4 years old	dose 15 drops
7 years old	dose 20 drops
14 years old	dose 30 drops
20 years old	dose 40 drops
From 20 to 60 years old	dose 60 drops

GRADUATED TABLE FOR ADMINISTERING LAUDANUM.

For a child at birth, or 1 month old	½	to	1 drop
Under a year old	½	to	3 drops
From 1 to 2 years	1	to	5 drops
From 2 to 5 years	2	to	8 drops
From 5 to 10 years	5	to	15 drops
From 10 to 15 years	10	to	20 drops
At 15 years	15	to	20 drops
For an adult	25	to	30 drops

HOW TO PREPARE HERBS.

When a plant has reached a stage of its growth when all its properties are fullest it is the proper time to gather it.

Roots.—The best time to gather roots is before the sap rises in the spring, but they may be taken after the leaves have dried in the fall.

Barks.—Gather in the fall or early spring, and, after removing the outside portion of the bark, cut and put in a dry place.

Berries and Fruits.—Hang in a cool, dry place or spread on tables or shelves.

Seeds and Flowers.—When they have fully ripened, place to dry in a shady place.

Medical Herbs.—Gather any time while blooming, before the autumn frosts, and dry in the shade.

Leaves.—Should be collected when the bloom is on the plant, and hung or spread in a current of air so as to be hastily dried.

All druggists know that tin canisters are the best in which to keep powders, where they can be dry and in a dark place; roots in barrels or wooden cases and extracts and tinctures in jars and bottles away from the light.

How to Prepare Herbs for Use.—To make an infusion or decoction, take two ounces of the plant, bruise, and add a quart of water. Tinctures are made by taking two ounces of the powdered article and adding a quart of alcohol and letting stand two weeks. Essences are made by dissolving two ounces of the essential oils in a quart of alcohol. Infusions or teas are made by taking a half cupful of the herb and allowing to simmer slowly over the fire. Decoctions are made in the same way, only make sure to extract the full strength from the herb.

GARDEN PLANT REMEDIES.

Wild Grape.—This is known as Oregon grape-root, a species of barberry. It has been used successfully to cure the leucorrhea or whites. Boil an ounce of the root in a pint and a half of water down to a pint. The dose is a wineglassful before each meal, and one before retiring. This remedy is equally recommended as a blood purifier.

Or, employ as an injection one-half ounce of the fluid extract of Canadian pine (*Pinus Canadensis*) to a pint of tepid water. Use this three times a day with a liquid syringe.

Yerba Reuma.—Fluid extract of yerba reuma is a favorite cure for catarrhal affections. It is used by pouring a small quantity of the liquid into the hollow of the hand, placing the finger on one nostril and sniffing the liquid into the other nostril. Then do the same with the other nostril. This should be repeated four or five times daily. If the catarrhal discharge is copious, the nostrils should first be cleansed by previous sniffs of warm water; and if the discharge be offensive a half teaspoonful of carbolic acid may be added to the water.

Chittim Bark.—This is known medicinally as cascara sagrada. It is much used by modern physicians for the cure of constipation, and is an excellent home remedy. It is prepared for use by steeping a half ounce of the bruised bark for half an hour in a half pint of warm water. When cool, take a teaspoonful three times a day. If the fluid extract of the bark is used the dose would be from ten to fifteen drops, three times a day. Sometimes it acts as a physic. In such cases the size of the dose should be diminished.

Wild Yam.—This plant has come into modern favor as a remedy for appendicitis. It is used by mixing a teaspoonful of the extract in a half tumbler of water, and taking a teaspoonful of the mixture every half hour. When relief comes diminish the dose to once every hour or two. This treatment is regarded by some doctors as the best the profession affords.

Unicorn Root.—This is sometimes called star-root. It ranks as an excellent remedy for falling of the womb. Make it into a strong tea, and take half a teaspoonful three times a day.

Camphor Tree.—The uses of camphor in medicine are numerous. It affords one of the safest and surest of household remedies for headache, spasms, neuralgia, gout, rheumatism and general debility. It is equally efficacious as an external remedy for pains, sprains, chilblains, bruises and flesh soreness. In such cases the tincture is generally used, and it can be made at home by mixing an ounce of the gum with a pint of spirits. It affords a speedy remedy for colds, in the form of a drink made of one pint of hot water into which ten drops of the spirits of camphor has been dropped. It should be sipped slowly and as hot as can be taken.

Almond Tree.—The fruit of the tree yields the almond oil which is so useful in the preparation of cosmetics and toilet articles. Sweet almond oil will prevent wrinkles if applied to the face once a week, and well rubbed in. If applied to a wrinkled face two or three times a week before retiring, it will have the effect of removing the wrinkles.

Turpentine Tree.—This species of pine yields the oil and spirits of turpentine so useful in the cure of diseases. Application to the back of the neck of a cloth thoroughly wetted with spirits of turpentine will afford speedy relief in cases of fits and convulsions. Five drops of the spirits on a little sugar, swallowed slowly, and once or twice a day will cure sore throat. In cases of dysentery, ten drops on a little sugar taken every four hours usually effects a cure. A turpentine liniment, valuable in cases of sprains, bruises and rheumatism, is made of equal parts of spirits of turpentine and vinegar, to which has been added the yolk of one egg.

Peach Tree.—Physicians who have tried the virtues of peach leaves as a cure for jaundice speak of them with praise. Steep a handful of the bruised leaves or twigs in enough cold water to cover them. The dose is a fourth of a teacupful three or four times daily. A tea made of peach leaves or bark is a purgative and good for worms. It should be given in tablespoonful doses to adults, until it operates. Children should take teaspoonful doses. In two to four tablespoonful doses every two hours it will check the vomiting in cholera morbus and morning sickness.

White Pond Lily.—A tea of this plant injected into the neck of the womb is highly recommended as a cure for ulceration of that organ. At the same time the tea should be taken internally as an accessory treatment, the dose being half a teacupful two or three times daily. If the fluid extract of the plant is used, the dose should range from four to twenty drops three times a day.

Liver Wort.—A strong tea of this plant, called also kidney plant, in teacupful doses four or five times daily, is recommended as an excellent remedy for kidney complaint.

Pink Root.—This plant offers an old stand-by for worms. An ounce of the root, mixed with four drachms of senna, should be steeped in a quart of water. The dose is two tablespoonfuls twice a day. If the root is used in the form of a powder, the dose is ten to twenty grains for children, and one to two teaspoonfuls for adults.

Radish.—This vegetable is mentioned by medical authority as a cure for Bright's disease. The desired result is reached by eating a small sized radish three times a day.

Tomato.—The tomato remedy for cholera infantum meets with much favor by those who have tried it. It is prepared by adding sugar to peeled ripe tomatoes. The dose is a teaspoonful every half hour until relieved; then continue with like doses every two or three hours till a permanent cure is effected. Some remarkable cures are mentioned in connection with this simple remedy.

Grape Vine.—The grape vine affords very many excellent home remedies. It is highly recommended by authorities as an effective remedy for dropsy. It is made ready for use by burning the inner bark to an ash, and taking a dessertspoonful in half a teacupful of sweetened water. The dose should be doubled when the stomach will stand it. The sap of the grape vine makes an excellent eye water for sore eyes. It is also used as a solvent of stone in the bladder and as a gargle for sore throat.

Pumpkin.—The seeds of the pumpkin afford a well recognized remedy for worms, retention of urine and inflammation of bladder and bowels. Oil of the seeds operates as a speedy diuretic in doses of from six to ten drops four or five times a day. If a tea of the seeds be used as a diuretic it may be drank freely at intervals of two to three hours. Pumpkin seeds are highly recommended for the destruction and removal of tape worm. The seeds should be peeled and beaten in with sugar till a paste is formed. Then dilute with milk, and drink freely, always on an empty stomach. In the course of a few hours the patient should take an active cathartic for the removal of the tape worm, composed of a tablespoonful of castor oil and the same quantity of turpentine. The drug stores now furnish a fluid extract of pumpkin seeds for the destruction of tape worm, the dose being from a half to a whole tablespoonful every three or four hours, followed, as before mentioned, by a large dose of castor oil and turpentine.

Celery.—Various medicinal preparations of celery are used in the treatment of chronic rheumatism. Of these celerina is a favorite with doctors. The same result is reached by drinking freely several times a day of a tea made by boiling celery stalks till they are soft. At the same time celery, cooked or raw, should be used regularly as a table food.

Onion.—Hardly any plant furnishes more or better home remedies than the onion. Cooked as a sauce and eaten freely it is a cure for constipation. Cut into slices and sprinkled with sugar, a syrup is formed which is excellent in croup, the dose being a teaspoonful every fifteen to twenty minutes, till relief is had. A crushed onion poultice will extract the heat and pain of a burn or scald. The squeezed juice of the onion, mixed with sugar, and given in teaspoonful doses every three or four hours is highly recommended as a cure for bronchitis.

Bean.—Those who have tried the white navy bean as a cure for erysipelas say it furnishes a sure cure if the disease is taken in time. The beans should be boiled soft and applied as a poultice to the affected parts. Renew frequently.

Red Pepper is employed with great success as a gargle in scarlet fever. It is prepared by taking half a teaspoonful of the pepper and one tablespoonful of table salt to a half-pint of boiling water. Thoroughly mix and strain, and then add about half a teacupful of vinegar. Use frequently as a throat gargle, and give internally half a teaspoonful every hour to a child, doubling the amount for an adult. Red pepper is also recommended as a cure for the grippe, in the form of a tea of the pod, or of the ground pepper, a teaspoonful to half a pint of water. Place a teaspoonful of the tea in a glass of hot water, and drink slowly every three or four hours.

The Beet.—Whenever tried the juice of the common beet has been found a remedy for gravel. Boil the beets till thoroughly done. Remove the beets and boil the juicy water again till it assumes the form of a syrup. Take a cupful three or four times a day. Pursue the treatment till the stones soften and pass. Good also for suppressed or tardy menses.

Cranberry.—A cranberry poultice is an excellent application to the affected parts in cases of piles. They also serve as a cure when cooked as for table use, and partaken of freely at each meal. Pounded cranberries, applied as a poultice, are excellent for removing the pain and inflammation of erysipelas. In doses of a tablespoonful daily cranberry extract is said to afford relief in hysteria.

Pineapple.—A tablespoonful of the juice of a pineapple, taken every three hours, is recommended as a remedy for diphtheria. The same may be used as a gargle after each dose.

Dandelion Wine.—A spring drink for cleansing the blood. In a jar containing two quarts of blossoms pour three quarts of hot water. Let stand forty-eight hours, strain and add two teaspoonfuls of dry yeast and a teacupful of white sugar. Flavor with lemon or wintergreen. A wineglassful three or four times a day.

THE LEMON IN MEDICINE AS A CURATIVE OF DISEASES.

The Lemon is the fruit of the *citrus limonum*, a native tree of India, but now naturalized in all warm climates. It is supposed that the Greeks and Romans were unacquainted with the lemon, which only became known to Europeans at the time of the Crusades. To-day it is known the world over and its medical uses are numerous.

Scurvy.—One of the most beneficial applications of lemon is the use of its juice for the prevention and cure of scurvy. For this purpose ships destined for long voyages are always provided with a supply of the concentrated juice or (its equivalent) lime juice; from one to two ounces should be given every two to four hours diluted with an equal amount of water.

Fevers.—Next to its use as an anti-scorbutic (a cure for scurvy) lemon juice is most valuable as a drink (in febrile affections) in which the thirst is urgent and the bowels are not disordered. This is usually the case in eruptive and periodical fevers such as—

Scarlet Fever, Malarial Diseases (Chills and Fever).—Lemon-juice furnishes a most agreeable and refreshing beverage and proves an admirable refrigerant.

It may be given with sweetened water in the shape of lemonade. This is an old English remedy, formerly called the "King's Cup," made as follows:

Add two lemons sliced, and two ounces of sugar to two pints of boiling water; allowing this to digest till cold, when it is ready for use in ounce doses *ad libitum*. Or lemon-juice may be added to the mildly nutritive drinks, such as gum water, Irish moss tea, barley water, and so forth.

Rheumatism and Gout.—Lemon-juice has been used with beneficial effects in acute and chronic rheumatic affections. According to statement of a noted physician "the sensible operation of the remedy consists in reducing the force and frequency of the pulse, a mitigation of severity of the attack and in securing an early relief from pain."

Prescribed in doses of one or two ounces of juice (freely diluted) three or four times a day. This is generally well tolerated, yet sometimes occasions severe griping or diarrhœa.

Coughs and Colds, Hoarseness.—The following will be found soothing and healing in most ordinary coughs and colds:

Whole flaxseed	2 ounces
Water, boiling	1 pint
Juice of two lemons.	
Sugar.	

Pour the boiling water on the flaxseed in a suitable vessel, let it steep three hours, pour off the clear liquid, add the lemon juice and sweeten to taste. Ice it for drinking. Dose, one ounce.

Jaundice.—Lemon-juice in tablespoonful doses several times a day is reputed to be a remedy for jaundice produced by congestion of the liver.

Hemorrhages.—It not only assuages thirst, but directly counteracts the tendency to loss of blood. Administered as lemonade in one- or two-ounce doses as cold as possible.

Biliousness.—The use of lemon-juice, in doses of one or two ounces diluted with hot or cold water, three or four times a day is an invaluable remedy. It is supposed to act as an eliminator of bile.

Erysipelas.—In this affection rest, saline laxatives, low diet and cooling drinks are the elements of treatment in mild and simple cases. A very refreshing and agreeable way of prescribing a cooling drink and at same time obtaining valuable diaphoretic and diuretic effects is by administering the following:

Take one drachm (60 grains) of bicarbonate of potassium and water four fluid ounces. Make a solution, of which add a teaspoonful to a tablespoonful of lemon-juice diluted with a tablespoonful of water and drink during effervescence every three or four hours.

The Grippe.—As a mild diaphoretic and as acting on the kidneys, and to allay restlessness and watchfulness in fever use the following:

Lemon-juice and water, equal parts, enough to make four ounces; bicarbonate of potassium one drachm; water, three ounces.

Make and keep in separate solutions. To be mixed in tablespoonful doses several times daily and taken while effervescing.

Vomiting.—The effervescing draught given under erysipelas (which see) is one of the best remedies for allaying nausea or a tendency to sickness.

Dropsy.—Mild and sustained diaphoresis is entitled to special favor. The skin must be brought into a state of moderate excitement by external warmth—by hot baths twice a day—at same time administering hot lemonade, after which put patient to bed. Free perspiration will follow, and an improvement in the quantity and quality of the urine, and a material subsidence of the dropsy or edema will ensue.

Asthma.—The administration of tablespoonful-doses of lemon-juice in a glassful of any of the mineral waters, three times a day, has been productive of manifestly good results.

As an Antidote in Alkaline Poisoning.—In cases of poisoning by the alkalies the vegetable acids are their antidotes, and the most convenient, easily procurable acidulous substances are, in general, vinegar or lemon-juice.

As an Anti-Narcotic.—In poisoning by narcotic substances, as opium, lemon-juice may be administered after the poison has been vomited or removed from the stomach, to counteract the effects.

Syphilis.—In some cases of syphilis a cachetic or scorbutiform condition of the blood is apt to obtain, and in such fresh lemon-juice several times daily has been found a valuable adjunct to the regular treatment outlined for this disease.

Headache.—A remedy which may very often be given with advantage for severe forms of headache is bromide of potassium in five- or ten-grain doses twice daily, followed by an ounce or two of effervescing lemonade, as prescribed under "The Grippe" (which see). If not very severe the effervescing draught (alone) will be found efficient and secure prompt relief.

To Remove Tan from Face.—Rubbing the half of a cut lemon on face at night or bathing the face with lemon-juice, allowing same to dry, and washing it off carefully with castile soap and warm water every morning, is said to have proved very efficacious.

Corns.—A slice of lemon held in place by bandage over offending hard corn, or placed between the toes for soft corns for several successive days, is an old well-tried standard remedy.

Itching of Anus or Scrotum.—Lemon-juice has been used with advantage as a local application in itching of the genitalia (privates) and anus.

Diphtheritic Sore Throat and Gangrenous Sore Mouth.—Lemon-juice has been used with striking advantage as a local application (gargle and mouth wash) in these diseased conditions; also in other varieties of gangrene from constitutional causes.

SALT IN MEDICINE AS A CURATIVE FOR DISEASE.

History.—Salt is a necessary and indispensable seasoning of our food, and as such must doubtless have been known to and employed by the first individuals of our race. The earliest notice of it occurs in the writings of Moses (Genesis, xix: 26; Leviticus, ii: 13) and Homer (Iliad, lib., ix: 214). It has received various names, such as common salt, culinary salt and chloride of sodium, and so forth.

Salt and the Blood.—It serves some important and essential uses in the animal economy. It is employed by the people of all nations, from the most refined to the most barbarous. It is an invariable constituent of the healthy blood.

In moderate quantities it promotes the appetite, assists digestion and assimilation.

Salt a Tonic.—In some diseases the moderate use of salt produces the effect of a tonic. It acts as a stimulant to the mucous membranes, the absorbent vessels and glands.

For External Application.—Salt is used for various external applications. Thus, a saturated solution, applied with friction, is employed as a counter-irritant in glandular enlargements and chronic diseases of the joints.

Stimulant.—As a stimulant it is rubbed on the chest in fainting, and so forth.

Hemorrhage.—On the sudden occurrence of bleeding or vomiting of blood it is usefully resorted to to stop the flow, in the dose of a teaspoonful, taken dry.

Stomach Pains or Gastrodynia.—Salt in a teaspoonful dose, dry, is used in some cases with considerable advantage.

Malaria (Ague).—In the course of experiments made in Paris, France, common salt in half-ounce doses has been found very efficient and second only to quinine, but the dose being very bulky causes vomiting in many cases. But the suggestion is a valuable one, where quinine cannot be administered.

Sore Eyes.—A small pinch of salt (about three grains) added to an ounce of clear, filtered boiled water makes a very soothing and beneficial eye-lotion. Apply with a small tube or dropper several times daily.

Emetic.—To produce vomiting the dose of salt is one or two tablespoonfuls in a tumblerful of water. A teaspoonful of mustard flour assists its action.

Purgative.—For producing evacuations from the bowels it is employed in the form of an enema. One or two tablespoonfuls of common salt dissolved in a pint or quart of starch water forms a very useful clyster.

As Worm Cure.—For this purpose it is administered in large doses by the mouth, or, when the worms are lodged in the rectum, a strong solution is administered in the form of an enema.

Felon.—Take common salt, roast it on a hot stove till dry as possible. Take a teaspoonful of it, also a teaspoonful of pulverized castile soap and a teaspoonful of Venice turpentine; mix them well into a poultice and apply to the felon. Renew twice daily and in four or five days the felon will open, release the pent-up matter and get well.

Toothache Cure Infallible.—Pulverize and mix alum and common salt in equal quantities; wet a small piece of cotton and cause the mixture to adhere to it; place in the hollow tooth. A sensation of coldness will be first produced, which will gradually subside and with it the tormenting toothache.

Sprains and Bruises.—Half fill a bottle with common salt; add good brandy till nearly full. Shake it well and allow to settle. Bathe the part with a soft linen cloth or sponge.

Hives.—Ordinary salt baths are of great value, promptly relieving the terrible itching. Two ounces of salt are added to about thirty gallons of warm water.

Heartburn.—A few grains of table salt allowed to dissolve in the mouth and frequently repeated will ensure prompt relief.

Sore Throat.—Gargling the throat with a weak solution of salt and water will often cure this difficulty without further treatment.

Catarrh.—A warm, weak solution of salt and water (a half to one teaspoonful of salt to a tumblerful of warm water) sniffed up the nose night and morning oftentimes leads to a speedy cure in mild cases.

Diarrhœa and Dysentery.—In these affections salt has been satisfactorily administered in combination with lemon juice. A half drachm of salt to a tablespoonful or two of lemon-juice diluted, and repeated every two hours till relieved.

Fits, Apoplexy, Convulsions, and so forth.—Salt placed on tongue dry acts admirably in these affections.

Cholera Morbus.—Salt solution by the mouth and as enemata is strongly recommended for this disease.

General Administration.—Common salt in small doses acts as a stimulant tonic and anthelmintic or worm cure; in larger ones as a purgative and emetic. It certainly promotes digestion, and the almost universal animal appetency for it proves it to be a salutary stimulus in health. When taken in larger quantities than usual with food it is useful in some forms of dyspepsia, and, by giving greater tone to the digestive organs in weakly children, may correct the disposition to generate worms. On the sudden occurrence of hemoptysis or vomiting of blood it is usefully resorted to as an astringent in the dose of a teaspoonful, taken dry, and often proves successful in stopping the flow of blood.

Local Application.—Externally applied in solution it is stimulant, and may be used either locally or generally. Locally it is sometimes employed as a fomentation in sprains and bruises; and as a general external application it forms the salt-water bath, a valuable remedy as a tonic and excitant in depraved conditions of the system, occurring especially in children, and supposed to be dependent on the scrofulous diathesis. A pound of salt dissolved in four gallons of water, forms a solution of about the strength of sea-water, and suitable for a bath.

Inward Uses.—It is frequently used as an ingredient in stimulating enemata. The dose, as a tonic, is from ten grains to a drachm; as a cathartic, though seldom used for that purpose, from two drachms to half an ounce. In doses of from half an ounce to an ounce, dissolved in four or five times its weight of water, it frequently proves a prompt and efficient emetic, invigorating rather than depressing the powers of the system. When employed as a clyster it may be used in the amount of from one to three tablespoonfuls dissolved in a pint of water.

LIGHT CURE.

Few maladies have caused more apprehension than lupus. Its victims often suffer a living death. While visiting her native country, Queen Alexandra, of England, learned of Dr. Finsen, a Danish physician, who had discovered a cure for the dread disease. The Queen introduced it into the London Hospital, where it has been tried with invariable success. Since its introduction the hospital has had several patients, all of whom have been dismissed as cured. The cure consists in an exposure of the patient to the concentrated rays of a powerful light. The rays emanate from an electrical machine, two or three of which have been added to the hospital since the introduction of the first, at the expense of the Queen, and all of them are producing the wonderful cures effected by the first.

KEROSENE OIL AS A HANDY HOME REMEDY.

Appendicitis.—Since the theory that this disease is curable by absorption has gained prominence, the use of kerosene oil in connection with the cure has been found useful.

Consumption.—A cloth saturated with kerosene oil, bound around the chest at night and frequently repeated, will remove lung soreness, and it may be taken inwardly with advantage. Eight to ten drops three or four times a day in sarsaparilla. It has been tried efficaciously as a cure for consumption.

Colds.—Ten to twelve drops of kerosene oil on cut loaf sugar, taken every two or three hours, has been found effective in curing colds, also rub neck and chest.

Toothache.—Cotton saturated with kerosene and placed in the tooth, often affords immediate relief.

Croup.—Kerosene has been used in croup with success. It may be taken internally and applied externally.

Burns.—Cloths saturated with kerosene, and applied to burns, exclude the air and bring desired relief from pain.

Bunions and Corns.—A continuous application to corns and bunions for a few days will reduce inflammation and pain, and an entire removal of the corn may be brought about.

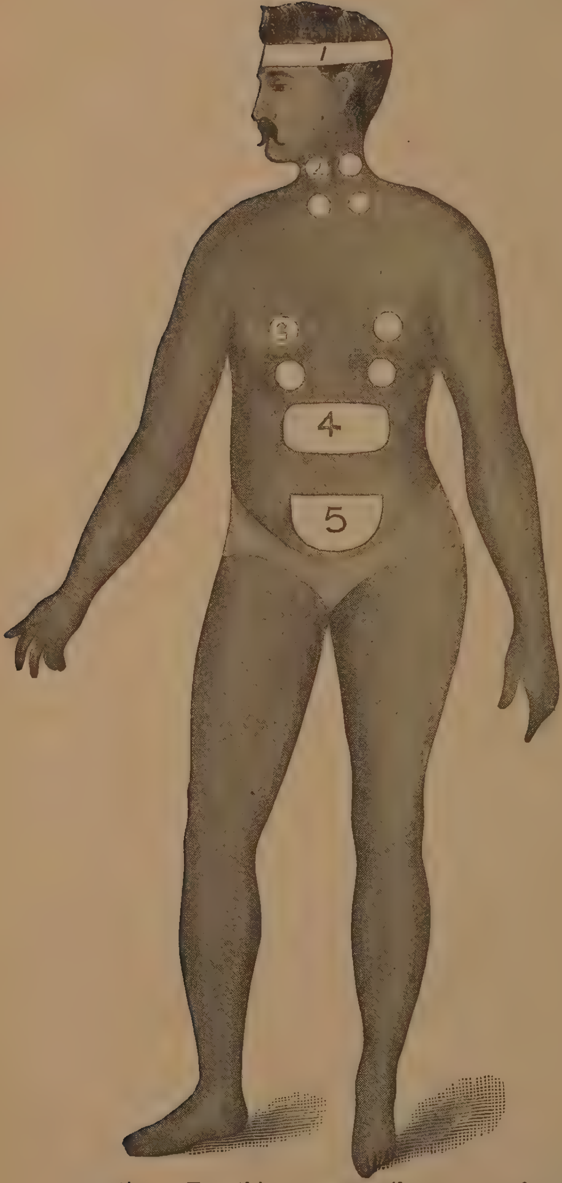
Diphtheria.—Swabbing of the throat, at intervals of two to three hours, with kerosene, has been found effective in destroying the membrane of diphtheria and reducing inflammation.

Vegetable Poisons.—Kerosene is an excellent lotion for the external inflammation resulting from vegetable poisons. It should be applied frequently until relief is had.

Quinsy.—External and internal use of kerosene has a remedial effect in this obstinate disease.

Rheumatism.—Petroleum was a favorite Indian remedy for rheumatism. In the purer form of kerosene it is still regarded as a favorite remedy for this painful disease. It may be applied by frequent rubbing.

Cleansing the Scalp.—A little kerosene introduced into glycerine, constitutes an ointment that will speedily remove dandruff and contribute to a clean and healthy scalp.



SICK HEADACHE.

Bandage 1.—Sick and nervous headache may be cured by tying a stout bandage around the head at the point indicated by figure 1, in the adjoining cut. Keep the bandage saturated with camphor, alcohol or essence of peppermint. See index—Headache.

CROUP.

Circle 2.—At the points in adjoining cut indicated by figure 2, external applications should be applied to cure croup. A favorite application is petroleum, whose effects may be greatly aided by internal doses of syrup of onions, a teaspoonful every quarter of an hour, till relief is had. For further treatment, see index—Croup.

PNEUMONIA.

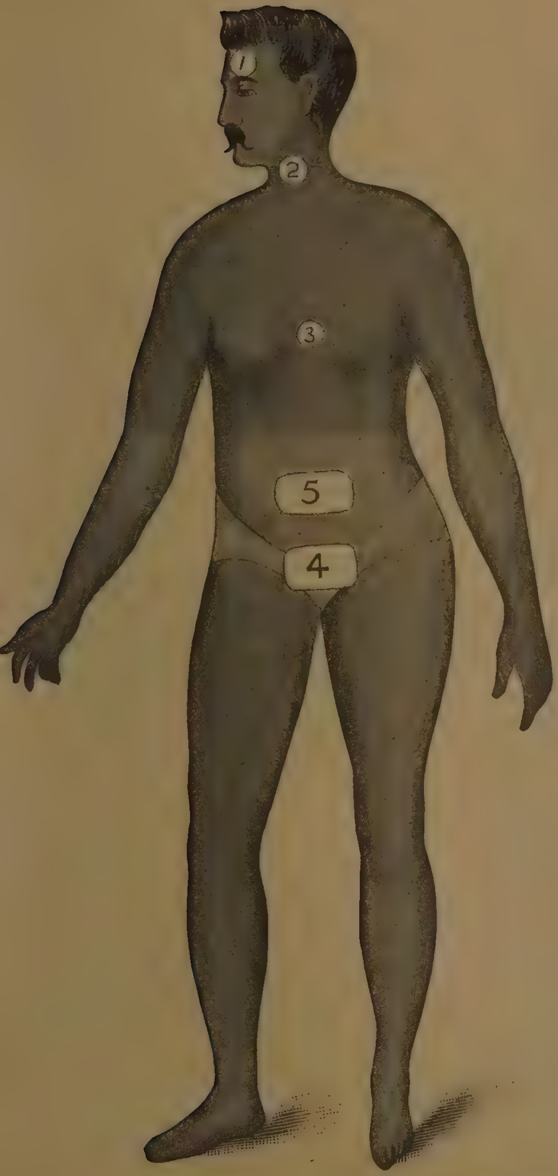
Applications of turpentine mixed with glycerine, sweet oil or lard, for the cure of pneumonia, should be made at the group of circles, in the adjoining cut, numbered figure 3. Hot poultices may be applied to the same place, with excellent effect. For further and fuller treatment, see index—Pneumonia.

SUNSTROKE.

In cases of sunstroke, ice, or cold water should be abundantly applied to the head, neck and chest. One of the most alarming symptoms attending sunstroke is heart failure. To meet this an application of hot water and mustard, or a mustard plaster, should be placed at the point indicated by figure 4, in the adjoining cut.

APPENDICITIS.

For this dread disease many doctors use the knife only. But more incline to a remedy by absorption. For this purpose oils, as petroleum or turpentine, are used both externally and internally. In the former case they are applied in the region indicated by figure 5 in the adjoining cut. In acute cases, applications of ice, or cold water, are made in the same region to reduce pain. See index—Appendicitis.



NERVOUS HEADACHE.

Circle 1.—A tight bandage tied round the head above the eyes, as indicated at circle 1 of adjoining figure, affords relief to nervous headache. It may be saturated with camphor, essence of peppermint, or salt water. See index—Headache.

DIPHTHERIA.

A free application of petroleum, well rubbed in, at the point indicated by circle 2, frequently cures diphtheria. Some medical men destroy the germs of diphtheria by blowing pulverized tannin upon the tonsils. Tannin is the inner bark of the oak. See index—Diphtheria.

HEART DISEASE.

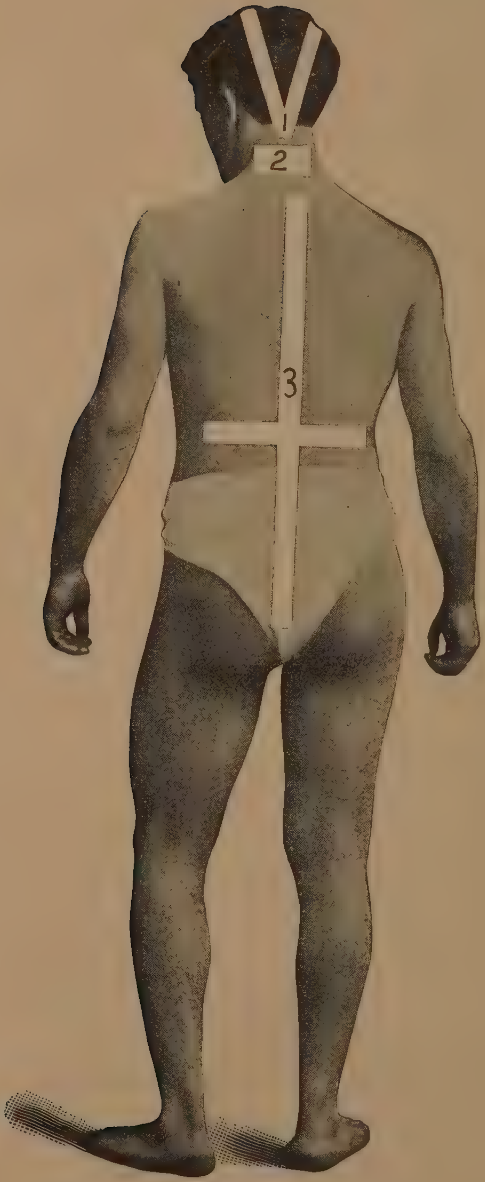
Circle 3.—This circle, in the adjoining plate, indicates where external applications for acute heart disease should be applied. The best of such applications is cloths dipped in hot water, to which ground mustard has been added. For full treatment, see index—Heart Disease.

RETENTION OF URINE.

Warmth applied at the point indicated by object 4 of the adjoining cut, in the form of heated salt water, or a hot salt bag, tends to start the flow, and give consequent relief to the bladder. See index—Urinary Diseases.

DIARRHŒA.

Object 5.—Diarrhœal affections. cholera morbus, etc., may be successfully treated externally by hot lotions, and petroleum and other oils, applied to the lower portions of the bowels, indicated by object 5 in the adjoining cut. See index—Diarrhœa.



HEADACHE.

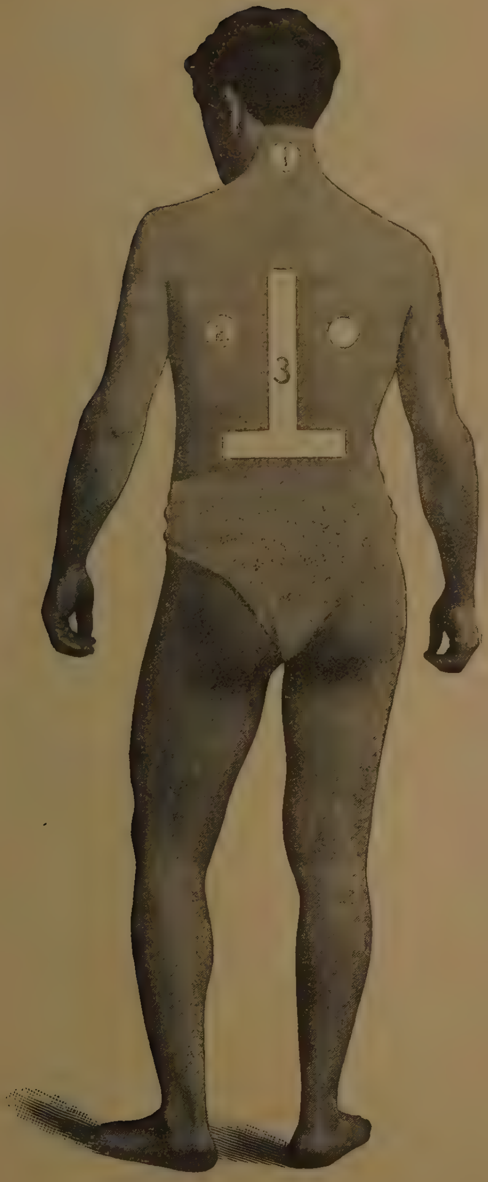
Headache, especially if it be of a nervous character, can be readily relieved by the application of a forked bandage, as shown at 1 in the adjoining figure. The bandage should be saturated with hot vinegar and pepper, spirits of ammonia or salty hot water. See index—Headache.

BLEEDING OF THE NOSE.

An ice application at the back of the neck at point indicated by 2 in the adjoining figure or the slipping of a cold piece of metal, as a key, down the spine, will check the bleeding. See index—Nose Bleed.

CONSTIPATION.

Effectual rubbing of the back and loins with goose-grease, or any of the oils used for cathartic purposes, along the lines indicated in the adjoining figure, mostly proves as efficacious in removing constipation as if taken inwardly. This applies especially to children. See index—Constipation.



CONVULSIONS.

By applying hot mustard water, a quick mustard plaster, spirits of turpentine or ammonia, to the part of the neck indicated by circle 1, in adjoining figure, speedy relief may be had. See index—Convulsions.

PLEURISY.

The circles indicated by 2 indicate the spots where external applications should be made to the back for the relief of pleurisy pains. Excellent remedies are hot poultices of flaxseed meal and hops, or hot salt bags. All applications should be kept as hot as the patient can bear. For full local and general treatment see index—Pleurisy.

AGUE.

Applications, three times daily, of turpentine and chloroform, in equal parts, to the regions of the back and loins indicated by figure 3 in the adjoining cut, are said to cure obstinate cases of ague or intermittent fever. For full treatment see index—Intermittent Fever.

ALIMENTS.	Form of Preparation.	Time Required for Stomachical Digestion.
Apples—mellow	Raw	2 hours
Apples—sour, hard	Raw	2 hours, 50 minutes
Apples—sweet, mellow	Raw	1 hour, 50 minutes
Barley	Boiled	2 hours
Bass—fresh	Broiled	3 hours
Beans—pod	Boiled	2 hours, 30 minutes
Beans and Green Corn	Boiled	3 hours, 45 minutes
Beef—fresh, lean, rare	Roasted	3 hours
Beef—fresh, lean, dry	Roasted	3 hours, 30 minutes
Beef—fresh steak	Broiled	3 hours
Beef—with salt only	Broiled	2 hours, 45 minutes
Beef—with mustard, and so forth	Broiled	3 hours, 30 minutes
Beef	Fried	4 hours
Beef—old, hard, salted	Boiled	4 hours, 15 minutes
Beets	Boiled	3 hours, 45 minutes
Brains—animal	Boiled	1 hour, 45 minutes
Bread—corn	Baked	3 hours, 15 minutes
Bread—wheat, fresh	Baked	3 hours, 30 minutes
Butter	Melted	3 hours, 30 minutes
Cabbage—head	Raw	2 hours, 30 minutes
Cabbage—with vinegar	Raw	2 hours, 30 minutes
Cabbage	Boiled	2 hours
Cake—corn	Baked	4 hours, 30 minutes
Cake—sponge	Baked	3 hours
Carrot	Boiled	2 hours, 30 minutes
Cartilage	Boiled	3 hours, 15 minutes
Catfish—fresh	Fried	4 hours, 15 minutes
Cheese—old, strong	Raw	3 hours, 30 minutes
Chicken	Fricassee	3 hours, 30 minutes
Codfish—cured, dry	Boiled	2 hours, 45 minutes
Corn (green) and Beans	Boiled	2 hours
Custard	Baked	3 hours, 45 minutes
Duck—domesticated	Roasted	2 hours, 45 minutes
Duck—wild	Roasted	4 hours
Dumpling—apple	Boiled	4 hours, 30 minutes
Eggs—fresh	Hard boiled	3 hours
Eggs—fresh	Soft boiled	3 hours, 30 minutes
Eggs—fresh	Fried	3 hours, 30 minutes
Eggs—fresh	Roasted	2 hours, 15 minutes
Eggs—fresh	Raw	2 hours
Eggs—fresh	Whipped	1 hour, 30 minutes
Flounder—fresh	Fried	3 hours, 30 minutes
Fowls—domestic	Boiled	4 hours
Fowls—domestic	Roasted	4 hours
Gelatin	Boiled	2 hours, 30 minutes
Goose—wild	Roasted	2 hours, 30 minutes
Heart—animal	Fried	4 hours
Lamb—fresh	Boiled	2 hours, 30 minutes
Liver—beef's, fresh	Boiled	2 hours

ALIMENTS.	Form of Preparation.	Time Required for Stomachical Digestion.
Marrow—animal, spinal	Boiled	2 hours, 40 minutes
Meat and Vegetables	Hashed	2 hours, 30 minutes
Milk	Boiled	2 hours
Milk	Raw	2 hours, 15 minutes
Mutton—fresh	Roasted	3 hours, 15 minutes
Mutton—fresh	Broiled	3 hours
Mutton—fresh	Boiled	3 hours
Oysters—fresh	Raw	2 hours, 55 minutes
Oysters—fresh	Roasted	3 hours, 15 minutes
Oysters—fresh	Stewed	3 hours, 30 minutes
Parsnips	Boiled	2 hours, 30 minutes
Pig—sucking	Roasted	2 hours, 30 minutes
Pig's-feet—soused	Boiled	1 hour
Pork—fat and lean	Roasted	5 hours, 15 minutes
Pork—recently salted	Boiled	4 hours, 30 minutes
Pork—recently salted	Fried	4 hours, 15 minutes
Pork—recently salted	Broiled	3 hours, 15 minutes
Pork—recently salted	Raw	3 hours
Pork—recently salted	Stewed	3 hours
Potatoes—Irish	Boiled	3 hours, 30 minutes
Potatoes—Irish	Roasted	2 hours, 30 minutes
Potatoes—Irish	Baked	3 hours, 20 minutes
Rice	Boiled	1 hour
Sago	Boiled	1 hour, 45 minutes
Salmon—salted	Boiled	4 hours
Sausage—fresh	Broiled	3 hours, 20 minutes
Soup—barley	Boiled	1 hour, 30 minutes
Soup—bean	Boiled	3 hours
Soup—beef, vegetables and bread	Boiled	4 hours
Soup—chicken	Boiled	3 hours
Soup—marrow bones	Boiled	4 hours, 15 minutes
Soup—mutton	Boiled	3 hours, 20 minutes
Soup—oyster	Boiled	3 hours, 30 minutes
Suet—beef, fresh	Boiled	5 hours, 30 minutes
Suet—mutton	Boiled	4 hours, 30 minutes
Tapioca	Boiled	2 hours
Tendon—boiled	Boiled	5 hours, 30 minutes
Tripe—soused	Boiled	1 hour
Trout—salmon, fresh	Boiled	1 hour, 30 minutes
Trout—salmon, fresh	Fried	1 hour, 30 minutes
Turkey—domestic	Roasted	2 hours, 30 minutes
Turkey—domestic	Boiled	2 hours, 25 minutes
Turkey—wild	Roasted	2 hours, 18 minutes
Turnips	Boiled	3 hours, 30 minutes
Veal—fresh	Broiled	4 hours
Veal—fresh	Fried	4 hours, 30 minutes
Vegetables and Meat—hashed	Warmed	2 hours, 30 minutes
Venison—steak	Broiled	1 hour, 35 minutes

FOOD COMPOSITIONS.

Cow's Milk.—In 100 parts—

Water	86.8
Albuminoids	4
Fats	3.7 to 4.50
Sugar	4.8
Salts	0.7

Butter.—In 100 parts—

Fats	88
Albuminoids	3.3
Water	6
Salts (variable)	2.7

Cheese.—In 100 parts—

Fats	24.3
Albuminoids	33.5
Water	36.8
Salts	5.4

White Wheaten Bread.—In 100 parts—

Carbohydrates	50.2
Albuminoids (nitrogenized matters)	7.5
Salts	1.6
Fats	1.5
Water	39.2

Oatmeal.—In 100 parts—

Water	15
Albuminoids	12.6
Fats	5.6
Carbohydrates	63
Salts	3

Rice.—In 100 parts—

Water	10
Albuminoids	5
Fats	0.8
Carbohydrates	83.2
Salts	0.5

Maize, Indian Corn.—In 100 parts—

Water	13.5
Albuminoids	10
Fats	6.7
Carbohydrates	64.5
Salts	1.4

Peas.—In 100 parts—

Water	15
Albuminoids	22
Fats	2
Carbohydrates	53
Salts	2.4

Potato.—In 100 parts—

Water	74
Albuminoids	2
Fats	0.16
Carbohydrates	21
Salts	1

Egg.—Ten per cent. of weight deducted for shell.

Water	73.5
Albuminoids	13.5
Fats	11.6
Salts	1.4

Eggs, Yolk.—

Water	51.5
Albuminoids	15
Fats	30
Salts	1.5

Eggs, White.

Water	84.5
Albuminoids	13.5
Fats	3
Salts	1.3

Beef.—Little fat; best quality.

Water	74.4
Fats	3.5
Albuminoids	20.5
Salts	1.6

Beef.—Roast or boiled, with drippings.

Water	54
Fats	15.45
Albuminoids	27.6
Salts	2.95

Pork, Salt.—

Water	44.1
Fats	7
Albuminoids	26.1
Salts	22.8

Smoked Ham.—

Water	27.8
Fats	36.5
Albuminoids	24
Salts	10.1

(Konig.)

Poultry.—

Water	74
Fats	38
Albuminoids	21
Salts	1.2

(Letheby.)

Chicago Corned Beef.—

Water	52.2
Fats	14
Albuminoids	23.3
Salts	4

TEMPERATE AND INTEMPERATE LIFE CHANCES.

An intemperate person's chance of living is—

At 20 years of age	= 15.6	years.
At 30 "	= 13.8	"
At 40 "	= 11.6	"
At 50 "	= 10.8	"
At 60 "	= 8.9	"

A temperate person's chance of living is—

At 20 years of age.................. = 44.2 years.
At 30 “ .... = 36.6 “
At 40 “ .... = 28.8 “
At 50 “ .... = 21.25 “
At 60 “ .... = 14.285 “

The average duration of life after beginning the habit of intemperance is—

For laboring men, mechanics, etc.	18 years.
For merchants, traders and commercial men.	17 “
For professional men.....................	15 “
For females	14 “

MEASLES AND RED-LIGHT.

Dr. Chatiner, of Berlin, makes known in a medical magazine the fact that his colored light cure for measles has obtained a permanent foothold in the German capital.

Treatment.—At his hospital patients with measles are kept in rooms well lighted with a subdued red-light, much like that in a photographer's dark room. At their homes he secures the same result by pasting red silk paper upon the window panes of the sick room. The patient receives no medicine, and is better in two or three days.

SIMPLE REMEDIES GIVEN IN LATIN AND ENGLISH.

THE DOSES ARE FOR ADULTS, EXCEPT WHERE OTHERWISE MENTIONED. SEE FOOT-NOTE.

ASTHMA.

LATIN.		ENGLISH.	
Lobelia folia	1 teacupful	Lobelia leaves	1 teacupful
Aqua bulliens	1 pint	Hot water	1 pint

Steep a half hour. Dose: One tablespoonful every fifteen to thirty minutes till free spitting of mucus is produced.

HOARSENESS.

Armoricia	2 ounces	Horseradish, grated	2 ounces
Acetum	½ pint	Cider vinegar	½ pint
Mel	1 gill	Strained honey	1 gill

Put the horseradish in the vinegar, let stand twelve hours, add the honey and heat it nearly to boiling. Strain and bottle. Adult dose, a teaspoonful four times a day till relieved.

CONSTIPATION.

LATIN.		ENGLISH.	
Inf. senna comp.	5 ounces	Compound infusion of senna	5 ounces
Potass. tart.	1 ounce	Tartrate of potash	1 ounce
Tr. senna Tr. jalap } of each	4 drachms	Tincture of senna Tincture of jalap } of each	4 drachms
Syr. rhamni	3 drachms	Syrup of buckthorn	3 drachms

Dose: Take one-fourth part at once, and repeat the dose every half hour until it operates.

DYSENTERY.

Amylum	2 ounces	Thin boiled starch	2 ounces
Tinct. opii	20 drops	Laudanum	20 drops

Use as an injection every six to twelve hours.

Tinct. rhei	1 ounce	Tincture rhubarb	1 ounce
Tinct. opii	2 drachms	Laudanum	2 drachms

Dose: One teaspoonful every three hours.

DIARRHŒA.

Rubus villosus	2 quarts	Ripe blackberries	2 quarts
Saccha alba	1 pound	White sugar	1 pound
Carophyllus	½ ounce	Cloves	½ ounce
Pimenta	½ ounce	Allspice	½ ounce

Boil all together. When cold press and strain. Add a pint of good brandy. Dose: A teaspoonful to wineglassful every two to four hours.

CHOLERA MORBUS.

Chloride sodium	3 teaspoonfuls	Common salt	3 teaspoonfuls
Piper nigrum	4 "	Black pepper	4 "
Acetum	½ teacupful	Cider vinegar	½ teacupful
Aqua bulliens	½ "	Warm water	½ "

Mix. Take tablespoonful every half hour until relieved.

Children's Doses. Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

HEART-BURN.

LATIN.		ENGLISH.	
Soda bi-carb	½ teaspoonful	Baking soda	½ teaspoonful
Aqua	½ teacupful	Water	½ teacupful

Take same after each meal.

INFLAMMATION OF THE BOWELS.

Ol. ricini	3 ounces	Castor oil	3 ounces
Ol. olivæ	2 "	Olive oil	2 "
Ol. terebinthinæ	2 teaspoonfuls	Oil of turpentine	2 teaspoonfuls

Adult dose, one tablespoonful every three or four hours.

CROUP.

Pulv. alumen	2 teaspoonfuls	Powdered alum	2 teaspoonfuls
Treacle	1 tablespoonful	Molasses	1 tablespoonful
Aqua bulliens	1 teacupful	Warm water	1 teacupful

Dose: For child one to three years old, a dessertspoonful every five minutes till relieved; for older children, a tablespoonful.

SIMPLE SORE THROAT.

Pulv. alumen	1½ teaspoonfuls	Powdered alum	1½ teaspoonfuls
Aqua	1 gill	Water	1 gill

Make gargle and use every hour.

DROPSY.

Pulv. jalapa	10 grains	Powdered jalap	10 grains
Potass. bitartras	1 teaspoonful	Cream tartar	1 teaspoonful
Aqua sacch.	1 wineglassful	Sweetened water	1 wineglassful

Take whole, once every four hours, until copious discharges are produced.

NEURALGIA.

Ex. belladonna	½ ounce	Extract belladonna	½ ounce
Vaseline	2 ounces	Vaseline	2 ounces

Mix. Rub on affected parts several times a day.

TETTER.

Ol. terebinthinæ	1 ounce	Turpentine	1 ounce
Hydrarg. ox. rub.	3 drachms	Red precipitate	3 drachms
Vaseline	4 ounces	Vaseline	4 ounces

Mix. Apply twice a day to affected parts.

SCROFULA.

Rumex crispus	1 pound	Yellow dock root	1 pound
Stillingia rad	1 "	Stillingia root	1 "
Taraxacum rad	1 "	Dandelion root	1 "
Sarsaparilla rad	1 "	Sarsaparilla root	1 "
Sassafras rad	½ "	Sassafras root	½ "
Aqua	4 gallons	Water	4 gallons

Cut the roots fine. Boil slowly till reduced to four quarts. Strain and add five pounds white sugar, stirred in with gentle heat. Then add eight drachms iodide of potash. Dose: Two tablespoonfuls three times a day.

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

SORE EYES.

LATIN.		ENGLISH.	
Soda biboras	2 grains	Borate of soda	2 grains
Aq. camph.	1 ounce	Camphor water	1 ounce

Mix. Drop one or two drops in eye four times a day.

BOILS.

Sulphur flores	6 tablespoonfuls	Flowers of sulphur.	6 tablespoonfuls
Potass. bitartras	3 “	Cream tartar	3 “

Dose: One teaspoonful night and morning in syrup or molasses.

BLEEDING FROM THE LUNGS.

Pulv. sacch. alb.	3 ounces	Powdered sugar	3 ounces
Pulv. rosin	3 “	Powdered rosin	3 “

Mix. Dose: One teaspoonful three times a day.

Or,

Acid tannic	30 grains	Tannin	30 grains
Pulv. sacch. alb.	1 drachm	Powdered sugar	1 drachm

Mix. Make ten powders and give one every ten minutes until relieved.

WETTING THE BED.

Ergot fluid ex.	1 ounce	Spurred rye	1 ounce

Dose: Ten to fifteen drops three times a day.

TAPE WORM.

Ol. terebinthinæ	1 tablespoonful	Turpentine	1 tablespoonful
Ol. ricini	1 teaspoonful	Castor oil	1 teaspoonful
Lactis	1 teacupful	Milk	1 teacupful

Mix, and for adult take at one dose. If not successful repeat next day.

PILES.

Vaseline	1 tablespoonful	Vaseline	1 tablespoonful
Sulph. flores	1 drachm	Flowers of sulphur.	1 drachm

Mix, and apply as an ointment three times a day.

EARACHE.

Succus alium	2 teaspoonfuls	Onion juice	2 teaspoonfuls
Ol. olivæ	2 “	Sweet oil	2 “
Tinct. opii.	1 “	Laudanum	1 “

Mix, and drop from four to six drops warm in affected ear. Repeat in half an hour if necessary.

GOUT.

Pulv. ulmus	2 tablespoonfuls	Powdered slippery elm..	2 tablespoonfuls
Wheat bran	3 “	Wheat bran	3 “

Mix with a weak solution of vinegar and apply warm to the affected parts.

GRAVEL.

Pyrus rad	1 quart	Apple root tea.	1 quart
Holland gin	1 pint	Holland gin	1 pint
Sacch. alb.	8 ounces	Loaf sugar	8 ounces

Small teacupful three times a day,

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

MEDICAL PRESCRIPTIONS.

For the Cure of Various Diseases, as Prepared and Used

BY W. W. MYERS, M. D., PHILADELPHIA, PA.

THE DOSES ARE FOR ADULTS, EXCEPT WHERE OTHERWISE MENTIONED. SEE FOOT-NOTE.

ABSCESSES (BOILS).

LATIN.		ENGLISH.	
℞.—Sulph. calcis	2 grains	℞.—Sulphide of lime.......	2 grains
Sacch. lactis	20 "	Sugar of milk.........	20 "
Mft. Cht. No. XX. One powder every hour or two. For children, two or three times a day.		Make 20 powders. Take one powder every hour or two. For children, two or three times a day.	

ASTHMA.

℞.—Ammonia bromid......	3 drachms	℞.—Bromide of ammonia...	3 drachms
Ammonia chlorid......	1½ "	Chloride of ammonia...	1½ "
Lobelia tinct..........	3 "	Tincture of lobelia.....	3 "
Spts. aeth. comp......	1 ounce	Com. spirits of ether...	1 ounce
Syrp. acacia	2½ ounces	Syrup of gum arabic...	2½ ounces
Mft. Take a teaspoonful every hour during paroxysm.		Take a teaspoonful every hour during paroxysm.	

BILIOUSNESS.

℞.—Podophyllin	6 grains	℞.—Podophyllin	6 grains
Aloin	6 "	Aloin	6 "
Ex. nucis vomicæ.......	6 "	Ex. nux vomica.........	6 "
Ex. belladonna..........	3 "	Ex. belladonna	3 "
Mft. Div. in pil. No. XXIV. Sig.—Take one or two pills at night, followed in morning by a dose of Rochelle salts.		Divide into 24 pills. Take one or two pills at night, followed in morning by dose of Rochelle salts.	

BRONCHITIS (ACUTE).

℞.—Liq. ammon. acetatis....	1 ounce	℞.—Liq. acetate of ammonia..	1 ounce
Syrp. ipecac	2 drachms	Syrup of ipecac	2 drachm
Liq. morph. sulph.......	60 minims	Liquor sulphate of morphia	60 minims
Syrp. acacia	2 ounces	Syrup of gum arabic....	2 ounces
Aqua dest	3 ounces	Water	3 ounces
Dose: Tablespoonful every two or three hours.		Dose: Tablespoonful every two or three hours.	

BRONCHITIS (CHRONIC).

℞.—Hydrocyanic acid, dil...	15 minims	℞.—Hydrocyanic acid, diluted	15 minims
Syrp. prunus virg......	1 ounce	Syrup of wild cherry...	1 ounce
Aq. camphor	1 ounce	Camphor water	1 "
Sig.—Take a teaspoonful every two or three hours.		Take a teaspoonful every two or three hours.	

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

BUNIONS.

LATIN.		ENGLISH.	
℞.—Iodine tinct.	2 drachms	℞.—Tincture of iodine	2 drachms
Belladonna tinct.	2 "	Tincture of belladonna	2 "
Mft. Apply twice a day with camel's-hair brush.		Apply twice a day with camel's-hair brush.	

BURNS AND SCALDS.

℞.—Soda bicarb.	2 ounces	℞.—Bicarbonate of soda	2 ounces
Aqua dest.	1 pint	Water	1 pint
Mft. Apply if skin is not broken.		Apply if skin is not broken.	
℞.—Acid carbolic	8 grains	℞.—Carbolic acid	8 grains
Vaseline	2 ounces	Vaseline	2 ounces
Mft. Apply on lint where skin is broken.		Apply on lint where skin is broken.	

CARBUNCLE.

℞.—Resorcin	2 drachms	℞.—Resorcin	2 drachms
Lanoline	1 ounce	Lanoline	1 ounce
Mft. Apply on lint.		Apply on lint.	

CATARRH (NASAL).

℞.—Acid carbolic liq.	30 minims	℞.—Liq. carbolic acid	30 minims
Soda bicarb.	1 drachm	Bicarbonate of soda	1 drachm
Soda biboras	1 "	Borax	1 "
Glycerina	½ ounce	Glycerine	½ ounce
Aq. rosæ	3½ ounces	Rose water	3½ ounces
Mft. To be used with atomizer four or five times a day.		To be used with atomizer four or five times a day.	

CATARRH (FAUCIAL).

℞.—Soda salicylate	2 drachms	℞.—Salicylate of soda	2 drachms
Soda biboras	3 "	Borax	3 "
Glycerina	4 "	Glycerine	4 "
Aq. rosæ	5½ ounces	Rose water	5½ ounces
Mft. A dessertspoonful in one pint of water and used with atomizer to throat.		A dessertspoonful in a pint of water and used with atomizer to throat.	

CHILBLAINS.

℞.—Camphor	75 grains	℞.—Camphor	75 grains
Alcoholis	3 drachms	Alcohol	3 drachms
Glycerina	5 "	Glycerine	5 "
Mft. Apply several times daily.		Apply several times daily.	

CHOLERA (SUN).

℞.—Tinct. opii	1 ounce	℞.—Laudanum	1 ounce
Tinct. capsici	1 "	Tinc. of cayenne pepper	1 "
Tinct. rhei. aromat.	1 "	Tinc. of rhubarb aromatic	1 "
Aq. menth. pip.	1 "	Peppermint water	1 "
Camphora spts.	1 "	Spirits of camphor	1 "
Sig.—Take 20 to 40 drops in water every two or three hours.		Take 20 to 40 drops in water every two or three hours.	

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

CHOLERA INFANTUM.

LATIN.			ENGLISH.		
℞.—Ex. belladonna fld.	50	drops	℞.—Fluid extract of belladonna	50	drops
Tinct. opii camph.	1½	drachms	Paregoric	1½	drachms
Soda sulphate	15	grains	Sulphate of soda	15	grains
Syrp. limonis	2	ounces	Syrup of lemons	5	ounces
Sig.—A teaspoonful every two or three hours to a child one year old. Increase or lessen with age.			A teaspoonful every two or three hours for a child one year old. Increase or lessen with age.		

CHOLERA MORBUS.

℞.—Spts. chloroformi	30	minims	℞.—Chloroform	30	minims
Morphia sulph.	½	grain	Sulphate of morphia	½	grain
Camphora spts.	20	minims	Spirits of camphor	20	minims
Aq. menth. pip.	1	ounce	Peppermint water	1	ounce
Sig.—A teaspoonful every hour.			A teaspoonful every hour.		

COLIC (INFANTILE).

℞.—Assafetida tinct.	15	drops	℞.—Tincture of assafetida	15	drops
Cinnamoni tinct.	30	"	Tincture of cinnamon	30	"
Syrp. rhei. aromat.	3	drachms	Syr. rhubarb aromatic	3	drachms
Soda bicarb.	20	grains	Soda bicarbonate	20	grains
Aq. dest.	1½	ounces	Water	1½	ounces
Sig.—Half a teaspoonful every two or three hours.			Half a teaspoonful every two or three hours.		

CONVULSIONS (INFANTILE).

℞.—Ammonia bromid	40	grains	℞.—Bromide of ammonia	40	grains
Potass. bromid	30	"	Bromide of potash	30	"
Ex. gelsemium fld.	20	drops	Fluid ext. of gelsemium	20	drops
Ex. valerian fld.	20	"	Fluid ext. of valerian	20	"
Aq. dest.	1	ounce	Water	1	ounce
Sig.—Half a teaspoonful for a child every two or three hours.			Half a teaspoonful for a child every two or three hours.		

CONSTIPATION.

℞.—Aloes soc.	20	grains	℞.—Aloes	20	grains
Gambogue	10	"	Gamboge	10	"
Saponis dura	5	"	White soap	5	"
Podophyllin	2½	"	May-apple	2½	"
Leptandrin	1½	"	Leptandrin	1½	"
Ol. capsici	1	drop	Oil capsicum	1	drop
Mft. Div. in pil. No. XII. Sig.—Take one three times a day.			Make 12 pills, and take one three times a day.		

CROUP (SIMPLE).

Give teaspoonful of glycerine as an emetic, then—			Give teaspoonful of glycerine as an emetic, then—		
℞.—Vin antim	2	drachms	℞.—Wine of antimony	2	drachms
Syrp. papaveris	½	ounce	Syrup of poppies	½	ounce
Syrp. tolu	2	drachms	Syrup of tolu	2	drachms
Aq. dest	1	ounce	Water	1	ounce
Sig.—A teaspoonful every hour or two for a child one year old. Increase or lessen with age.			Teaspoonful every hour or two for a child one year old. Increase or lessen with age.		

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

CROUP (MEMBRANOUS).

LATIN.	ENGLISH.
℞.—Apomorphiæ ....1-5 grain	℞.—Apomorphine .... 1-5 grain
Syrp. simplex .... 1 ounce	Simple syrup .... 1 ounce
Aq. dest............... 1 "	Water .... 1 "
Sig.—A teaspoonful every hour or two, according to the urgency of the case.	A teaspoonful every hour or two, according to urgency of case.

DIARRHŒA (ACUTE).

℞.—Tinct. opii deod.......15 drops	℞.—Tinc. opium, deodorized. 15 drops
Bismuth subnit .... 2 drachms	Subnitrate of bismuth.. 2 drachms
Syrp. simplex .... ½ ounce	Simple syrup .... ½ ounce
Mist. cretæ .... 1½ ounces	Chalk mixture ....1½ ounces
Sig.—A teaspoonful every two or three hours to a child one year old.	A teaspoonful every two or three hours to a child one year old.

DIARRHŒA (CHRONIC).

℞.—Ex. ergot .... 20 grains	℞.—Aqueous ext. of ergot... 20 grains
Ex. nucis vom......... 5 "	Extract of nux vomica.. 5 "
Ex. opii .... 10 "	Extract of opium...... 10 "
Mft. Div. in pil. No. XX. Sig.—One pill every three or four hours.	Make 20 pills. Take one pill every three or four hours.

DIPHTHERIA.

℞.—Pilocarpine muriate.....1-3 grain	℞.—Muriate of pilocarpine.. 1-3 grains
Pepsin cryst........... 10 grains	Crystals of pepsin..... 10 "
Acid hydrochloric ...... 2 drops	Hydrochloric acid ..... 2 drops
Aq. dest .... 2 ounces	Water .... 2 ounces
Sig.—A teaspoonful for child every hour or two, and apply with brush to throat.	A teaspoonful for a child every hour or two, and apply with brush to throat.
℞.—Potash chlor......... 20 grains	℞.—Chlorate of potash.... 20 grains
Tinct. ferri chlor..... 2 drachms	Tinc. chloride of iron. 2 drachms
Glycerina .... 1 ounce	Glycerine .... 1 ounce
Aq. rosæ .... 1½ ounces	Rose water .... 1½ ounces
Sig.—Apply to throat every hour.	Apply to throat every hour.

DYSENTERY (ACUTE).

℞.—Cupri sulph. .... ½ grain	℞.—Sulphate of copper...... ½ grain
Magnesia sulph. ....1 ounce	Epsom salts .... 1 ounce
Acid sulph. dil. ....1 drachm	Sulphuric acid, diluted.. 1 drachm
Aq. dest. ....4 ounces	Water .... 4 ounces
Sig.—A teaspoonful every hour or two.	A teaspoonful every hour or two.

DYSENTERY (CHRONIC).

℞.—Vin ipecac .... 1 ounce	℞.—Wine of ipecac.......... 1 ounce
Sig.—One drop every hour when stools are slimy.	One drop every hour when stools are slimy.

DYSPEPSIA (FLATULENT).

LATIN.	ENGLISH.
℞.—Bismuth subnit......... ½ drachm	℞.—Subnitrate of bismuth... ½ drachm
Magnesia .... ½ "	Magnesia .... ½ "
Pv. belladonna ....3 grains	Powdered belladonna... 3 grains
Pv. zingiber ....3 "	Powdered ginger....... 3 "
Mft. Cht. No. X. Sig.—One every three hours in aq. menth. pip.	Make 10 powders. Take one every three hours in peppermint water.

DYSPEPSIA (GASTRIC).

℞.—Soda sulph. gran......... 1 ounce	℞.—Sulphite of soda, gran... 1 ounce
Soda bicarb............ 1 "	Bicarbonate of soda..... 1 "
Pv. cinchona .... 1 "	Powdered chinchona .... 1 "
Sig.—A teaspoonful in half a glass of water before and after meals.	A teaspoonful in half glass of water before and after meals.

DYSPEPSIA (NERVOUS).

℞.—Bismuth sub. carb..... 3 drachms	℞.—Subcarbonate bismuth.. 3 drachms
Morph. sulph......... 1½ grains	Sulphate of morphia... 1½ grains
Pulv. aromatic .... 1 drachm	Aromatic powder...... 1 drachm
Mft. Cht. No. XII. Sig.—One before each meal.	Make 12 powders. Take one before each meal.

EARACHE.

℞.—Atropia sulph......... 1½ grains	℞.—Sulphate of atropia.... 1½ grains
Morph. sulph.......... 2 "	Sulphate of morphia... 2 "
Glycerina .... 1 ounce	Glycerine .... 1 ounce
Mft. Place one or two drops in ear on absorbent cotton two or three times a day.	Place one or two drops in ear on absorbent cotton two or three times a day.

ERYSIPELAS.

℞.—Ichthyol .... ½ ounce	℞.—Ichthyol .... ½ ounce
Ether sulph. ....2 drachms	Ether .... 2 drachms
Glycerina ....2 "	Glycerine .... 2 "
Mft. Apply locally.	Apply locally.

FLATULENCE.

℞.—Pulv. columbæ .... ½ ounce	℞.—Powdered columbæ .... ½ ounce
Pulv. zingiber .... ½ "	Powdered ginger .... ½ "
Aq. bullient ....1 pint	Hot water .... 1 pint
Senna fol. ....1 drachm	Senna leaves .... 1 drachm
Mft. infusion. Sig.—Take a wineglassful three times a day.	Make an infusion. Take a wineglassful three times a day.

HAY FEVER.

℞.—Hydrg. C. C.......... 1 grain	℞.—Corrosive sublimate.... 1 grain
Quinia mur........... 1 drachm	Muriate of quinine..... 1 drachm
Acid carbolic .... 1½ drachms	Carbolic acid .... 1½ drachms
Glycerina .... 6½ "	Glycerine .... 6½ "
Mft. Use with atomizer to nasal passages.	Use with atomizer to nasal passages.

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

HEADACHE (BILIOUS).

LATIN.	ENGLISH.
℞.—Ammonia chlorid ...... 3 drachms Morphia acetate .... 1 grain Caffeine cit. .... 30 grains Spts. ammon. aromat..... 1 drachm Elix. guarana .... 4 ounces Aq. rosæ .... 4 "	℞.—Chloride of ammonia.... 3 drachms Acetate of morphia..... 1 grain Citrate of caffeine...... 30 grains Aromatic spirits of ammonia .... 1 drachm Elixir guarana .... 4 ounces Rose water .... 4 "
Sig.—A teaspoonful every half hour until relieved.	A teaspoonful every half hour until relieved.

HEADACHE (NERVOUS).

℞.—Zinci phosphide .... 3 grains Ex. nucis vom........... 10 " Confec. rosæ .... q. s.	℞.—Phosphide of zinc......... 8 grains Ext. of nux vomica....... 10 " Confection of roses....... Sufficient quantity
Mft. Div. in pil. No. XXX. Sig.—One after each meal.	Make 30 pills. Take one after each meal.

HEART-BURN.

℞.—Soda bicarb .... 1 drachm Pulv. rhei. .... ½ ounce Spts. menth. pip....... 2 drachms Aq. dest. .... 4 ounces	℞.—Bicarbonate of soda.... 1 drachm Powdered rhubarb .... ½ ounce Spirits of peppermint... 2 drachms Water .... 4 ounces
Sig.—A tablespoonful after meals.	A tablespoonful after meals.

HICCOUGH.

℞.—Zinci valer. .... 8 grains Ex. belladonna .... 3 "	℞.—Valerianate of zinc........ 8 grains Ext. of belladonna........ 3 "
Mft. Div. in pil. No. XII. Sig.—Give one every three or four hours as required.	Make 12 pills. Give one every three or four hours as required.

JAUNDICE.

℞.—Hydrg. chlor. mite....... 6 grains Pulv. rhei. .... 3 " Podophyllin .... ¼ grain Soda bicarb. .... 8 grains	℞.—Calomel .... 6 grains Powdered rhubarb .... 3 " Powdered May-apple..... ¼ grain Bicarbonate of soda...... 8 grains
Mft. Cht. No. VI. Sig.—One every two or three hours.	Make 6 powders. Take one every two or three hours.

LUMBAGO.

℞.—Potass. iodid .... 4 drachms Vin colch. sem.......... 1 ounce Syrp. sarsaparilla comp.. 1 " Aq. dest. .... 1 "	℞.—Iodide of potash......... 4 drachms Wine of colchicum seed.. 1 ounce Com. syr. of sarsaparilla. 1 " Water .... 1 "
Sig.—A teaspoonful in water every three hours, and apply locally this.	A teaspoonful in water every three hours, and apply locally this.
℞.—Tinct. iodine .... 2 drachms Tinct. aconit root........ 3 " Spts. chloroformi .... 4 " Tinct. sapo. camph...... 9 "	℞.—Tincture of iodine....... 2 drachms Tincture of aconite root.. 3 " Chloroform .... 4 " Soap liniment .... 9 "

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

MARASMUS.

LATIN.

℞.—Ol. morrhuæ .... 2 ounces
Aq. calcis .... 4 drachms
Syrp. calcis lactophos.. 1½ ounces

Sig.—A teaspoonful three times a day for a child one year old. Increase or lessen with age.

ENGLISH.

℞.—Cod-liver oil .... 2 ounces
Lime-water .... 4 drachms
Syr. lactophosphate of lime .... 1½ ounces

A teaspoonful three times a day for a child one year old. Increase or lessen with age.

MALARIA.

℞.—Strych. sulph......... ½ grain
Acid arsenious .... ¾ "
Ferri pulv. ....15 grains
Quinia sulph. ....15 "
Aloes soc............. 3 "

Mft. Div. in pil. No. XX. Sig.—Take one pill every three hours.

℞.—Strychnine .... ½ grain
Arsenious acid .... ¾ "
Iron by hydrogen....... 15 grains
Quinine .... 15 "
Aloes .... 3 "

Make 20 pills. Take one pill every three hours.

MEASLES.

℞.—Acetanilid .... 10 grains
Quinia sulph.......... 20 "
Soda salicylate .... 10 "

Mft., mass and div. in cht. No. XV. Sig.—One every four hours.

℞.—Acetanilid .... 10 grains
Quinine .... 20 "
Salicylate of soda...... 10 "

Make 15 powders. Take one every four hours.

MUMPS.

℞.—Quinia sulph......... 10 grains
Potass. chlor......... 25 "
Tinct. aconite rad..... 10 drops
Spts. nit. dulc........ 2½ drachms
Syrp. simplex .... 14 "

Sig.—A teaspoonful every three hours for a child ten years old. Increase or decrease according to age.

℞.—Quinine .... 10 grains
Chlorate of potash.... 25 "
Tincture of aconite... 10 drops
Sweet spirits of nitre.. 2½ drachms
Simple syrup .... 14 "

A teaspoonful every three hours for a child ten years old. Increase or lessen according to age.

PLEURISY.

℞.—Morph. acetate .... ½ grain
Acetate potass......... ½ ounce
Tinct. verat. viride.....25 minims
Syrp. tolu .... ½ ounce
Liq. potass. citratis.... 2½ ounces

Sig.—A teaspoonful every two hours.

℞.—Acetate of morphia..... ½ grain
Acetate of potash...... ½ ounce
Tinc. verat viride...... 25 minims
Syrup of tolu.......... ½ ounce
Liquor citrate of potash.2½ ounces

A teaspoonful every two hours.

PNEUMONIA.

℞.—Potass. iodid.......... 1 drachm
Ammonia mur......... 1½ drachms
Mist. glycyrrhiza comp. 6 ounces

Sig.—A tablespoonful every three hours.

℞.—Iodide of potash....... 1 drachm
Muriate of ammonia... 1½ drachms
Com. mix. of licorice... 6 ounces

A tablespoonful every three hours.

INFLUENZA (LA GRIPPE).

℞.—Morph. sulph. ....1-3 grain
Potass. bromid. ...... 1 drachm
Ammon. chlorid. .....50 grains
Syrp. scillæ .... 2 drachms
Mist. glycyrrhiza comp 2½ ounces

Sig.—Take a teaspoonful every two hours.

℞.—Sulphate of morphia... 1-3 grain
Bromide of potash..... 1 drachm
Chloride of ammonia.. 50 grains
Syrup of squills....... 2 drachms
Com. mix. of licorice... 2½ ounces

Take a teaspoonful every two hours.

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

KIDNEYS (INFLAMMATION OF).

LATIN.

℞.—Flor. scoparius tinct.... 7½ drachms
Tinct. juniperi .... 2½ "
Aq. bullient .... 2 pints

Mft. an infusion. Sig.—Take a wineglassful four times a day.

ENGLISH.

℞.—Com. flowers of broom.. 7½ drachms
Juniper .... 2½ "
Hot water .... 2 pints

Make an infusion. Take wineglassful four times a day.

INFLAMMATION OF BREAST.

℞.—Ung. belladonna .... 1 ounce
Pulv. camphora .... 1 drachm

Mft. and apply to breast.

℞.—Ointment of belladonna... 1 ounce
Powdered camphor ...... 1 drachm

Mix together and apply to breast.

PRICKLY HEAT.

℞.—Soda biboras .... 6 drachms
Morph. mur. .... 6 grains
Aq. rosæ .... 6 ounces

Mft. Bathe the parts, and between applications dust on pulv. lycopodium.

℞.—Borax powder .... 6 drachms
Muriate of morphia...... 6 grains
Rose water .... 6 ounces

Bathe the parts, and between applications dust on lycopodium powder.

RHEUMATISM (ACUTE).

℞.—Acid salicylic .... 1 drachm
Spts. ammon. aromat.... ½ ounce
Syrp. simplex .... ½ "
Liq. potass. citratis..... 2 ounces

Sig.—A teaspoonful every two hours.

℞.—Salicylic acid .... 1 drachm
Aromatic spirits of ammonia .... ½ ounce
Syrup simple .... ½ "
Liquor citrate of potash. 2 ounces

A teaspoonful every two hours.

RHEUMATISM (CHRONIC).

℞.—Potass. bicarb. .... 2 drachms
Acid salicylic .... 2 "
Potass. iodid .... 2 "
Tinct. colch. sen......... 3 "
Syrp. aurant. cort....... 3 ounces

Sig.—A dessertspoonful every three hours.

℞.—Bicarbonate of potash.... 2 drachms
Salicylic acid .... 2 "
Iodide of potash......... 2 "
Tinc. of colchicum seed.. 3 "
Syr. of orange peel...... 3 ounces

A dessertspoonful every three hours.

RHEUMATISM (MUSCULAR).

℞.—Ammon. chlorid .... 1 ounce
Ex. cimicifuga fld......... 2 ounces
Syrp. acacia .... 1 ounce
Aq. lauro-cerasi .... 1 "

Sig.—A teaspoonful four times a day.

℞.—Chloride of ammonia...... ½ ounce
Ext. of blacksnake root.... 2 ounces
Syr. of gum arabic......... 1 ounce
Cherry-laurel water .... 1 "

A teaspoonful four times a day.

RINGWORM.

℞.—Hydrag. C. C........... 10 grains
Alcoholis .... 1 ounce
Ol. sinapis .... 1 drachm

Mft. lotion and apply several times a day.

℞.—Corrosive sublimate...... 10 grains
Alcohol .... 1 ounce
Oil of mustard.......... 1 drachm

Make lotion and apply several times a day.

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

PYEMIA (BLOOD POISONING).

LATIN.		ENGLISH.	
℞.—Acid salicylic	½ ounce	℞.—Salicylic acid	½ ounce
Soda biboras	1 drachm	Borax	1 drachm
Glycerina	1 ounce	Glycerine	1 ounce
Aq. menth. pip.	6 ounces	Peppermint water	6 ounces
Sig.—A tablespoonful every two hours.		A tablespoonful every two hours.	

SPITTING OF BLOOD (LUNGS) HEMOPTYSIS.

℞.—Tinct. cinnamoni	2 drachms	℞.—Tincture of cinnamon	2 drachms
Tinct. digitalis	30 drops	Tincture of digitalis	30 drops
Ex. ergot fld.	14 drachms	Fluid ext. of ergot	14 drachms
Sig.—A teaspoonful every hour and then decrease.		A teaspoonful every hour and then decrease.	

SPITTING OF BLOOD (STOMACH) HEMATEMESIS.

℞.—Ferri et ammon. sulph.	50 grains	℞.—Sulphate of iron and ammonia	50 grains
Aq. cinnamoni	4 ounces	Cinnamon water	4 ounces
Sig.—A tablespoonful every two or three hours.		A tablespoonful every two or three hours.	

SORE EYES (CONJUNCTIVITIS).

℞.—Acid boracic	8 grains	℞.—Boracic acid	8 grains
Aq. camphora	1 ounce	Camphor water	1 ounce
Aq. dest.	1 "	Distilled water	1 "
Mft. Bathe the eyes several times a day.		Bathe the eyes several times a day.	

SUPPRESSED MENSES (AMENORRHEA).

℞.—Tinct. ferri chlor.	3 drachms	℞.—Tinc. chloride of iron	3 drachms
Tinct. cantharides	1 drachm	Tinc. cathorides	1 drachm
Tinct. guaiac ammon.	1½ ounces	Ammoniated tincture of guaiac	1½ ounces
Tinct. aloes	½ ounce	Tincture aloes	½ ounce
Syrp. simplex	3½ ounces	Syrup simple	3½ ounces
Mft. A tablespoonful three times a day.		A tablespoonful three times a day.	

SLEEPLESSNESS (INSOMNIA).

℞.—Potass. bromid.	4 drachms	℞.—Bromide of potash	4 drachms
Chloral hydrate	2 "	Hydrate of chloral	2 "
Syrp. prunus virg.	1 ounce	Syr. of wild cherry	1 ounce
Aq. dest.	10 drachms	Water	10 drachms
Sig.—A teaspoonful at bedtime.		A teaspoonful at bed-time.	

PALPITATION (HEART).

℞.—Strophanthi	5 grains	℞.—Strophanthus	5 grains
Ferri sulph.	30 "	Sulphate of iron	30 "
Potass. carb.	30 "	Carbonate of potash	30 "
Mft., mass and div. in pil. No. XX. Sig.—One three of four times a day.		Make 20 pills. Take one three or four times a day.	

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

WETTING OF BED (INCONTINENCE OF URINE).

LATIN.	ENGLISH.
℞.—Strych. sulph......... 1 grain	℞.—Sulphate of strychnine 1 grain
Pulv. cantharides .... 2 grains	Powdered cantharides. 2 grains
Morph. sulph........ 1½ "	Sulphate of morphia.. 1½ "
Ferri redacti......... 20 "	Reduced iron .... 20 "
Mft., mass and div. in pil. No. XL.	Make 40 pills. Give one pill three times a day to a child ten years old. Increase or decrease according to age.
Sig.—One pill three times a day to a child ten years old. Increase or decrease according to age.	

WHITES (LEUCORRHEA).

℞.—Soda bicarb............ 1 drachm	℞.—Bicarbonate of soda..... 1 drachm
Tinct. belladonna .... 2 ounces	Tincture belladonna .... 2 ounces
Aq. dest................ 1 pint	Water .... 1 pint
Mft. Use as a vaginal injection.	Use as a vaginal injection.
℞.—Aristol .... 35 grains	℞.—Aristol .... 35 grains
Camphora .... 35 "	Camphor .... 35 "
Lupulin .... 35 "	Lupulin .... 35 "
Mft. suppositories No. XII. Insert one in vagina after each injection.	Make 12 suppositories. Insert one in vagina after injection.

WATER-BRASH (PYROSIS).

℞.—Quinia sulph. .... 12 grains	℞.—Sulphate of quinine... 12 grains
Acid sulph. dil....... 2 drachms	Sulphuric acid, diluted. 2 drachms
Spts. chloroform ..... 2 "	Chloroform .... 2 "
Tinct. aurant. cort.... 1½ ounces	Tinc. of orange peel.. 1½ ounces
Sig.—A teaspoonful in water every two or three hours.	A teaspoonful in water every two or three hours.

WHOOPING-COUGH (PERTUSSIS).

℞.—Cocci .... 10 grains	℞.—Cochineal .... 10 grains
Potass. bicarb......... 1 drachm	Bicarbonate of potash.. 1 drachm
Ex. belladonna fld...... 10 drops	Fluid ext. of belladonna 10 drops
Syrp. simplex .... 4 ounces	Syrup simple .... 4 ounces
Sig.—A teaspoonful every two or three hours for a child ten years old. Increase or decrease according to age.	Teaspoonful every two or three hours for a child ten years old. Increase or lessen according to age.

NEURALGIA.

℞.—Quin. sulph.......... 1 drachm	℞.—Sulphate of quinine... 1 drachm
Morph. sulph.......... 1½ grains	Sulphate of morphia.. 1½ grains
Acid arsenious....... 1½ "	Arsenious acid ...... 1½ "
Aconit ex............ 15 "	Extract of aconite.... 15 "
Strych. sulph........ 1 grain	Sulphate of strychnine 1 grain
Mft., mass and div. in pil. No. XXX. Sig.—Take one three or four times a day.	Make 30 pills. Take one three or four times a day.

SORE THROAT (QUINSY).

℞.—Tinct. guaiac .... 1½ ounces	℞.—Tincture of guaiac..... 1½ ounces
Glycerina .... 1½ "	Glycerine .... 1½ "
Sig.—A teaspoonful every hour or two.	A teaspoonful every hour or two.

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

SCARLET FEVER.

LATIN.	ENGLISH.
℞.—Tinct. ferri chlor........ 2 drachms Potass. chlor........... 3 " Syrp. simplex .... 4 ounces Sig.—A teaspoonful every hour to a child four or five years old. Increase or decrease according to age.	℞.—Tinc. chloride of iron.... 2 drachms Chlorate potash .... 3 " Simple syrup .... 4 ounces Teaspoonful every hour to child four to five years old. Increase or decrease according to age.
℞.—Resorcin .... 2 drachms Vaseline .... 1 ounce Mft. Apply to skin to hasten desquamation.	℞.—Resorcin .... 2 drachms Vaseline .... 1 ounce Apply to skin to hasten desquamation.

TOOTHACHE.

LATIN.	ENGLISH.
℞.—Pulv. arsenious acid.... 30 grains Cocaine hydrochlor..... 30 " Menthol crystals ...... 8 " Glycerine .... Sufficient Mft. paste. Sig.—Apply to tooth on absorbent cotton.	℞.—Powd. arsenious acid... 30 grains Hydrochlorate of cocaine. 30 " Menthol crystals ...... 8 " Glycerine ....Sufficient Make paste. Apply to tooth on absorbent cotton.

SMALL-POX (VARIOLA).

LATIN.	ENGLISH.
℞.—Acid carbolic.......... 2 drachms Acid acetic .... 2 " Tinct. opii .... 1 drachm Spts. chloroform ...... 1 " Aq. dest.............. 3½ ounces Sig.—A teaspoonful every two or three hours.	℞.—Carbolic acid .... 2 drachms Acetic acid .... 2 " Laudanum .... 1 drachm Chloroform .... 1 " Water .... 3½ ounces A teaspoonful every two or three hours.

WORMS (TAPE).

LATIN.	ENGLISH.
℞.—Tinct. rottlera .... 1 drachm Ex. filix mas aeth....... 2 drachms Syrp. acacia .... 1 ounce Mft. Make 2 doses. Sig.—First in morning, two hours after half-ounce ol. ricini, and in half an hour the remainder.	℞.—Kameela .... 1 drachm Male fern, ethereal ext.. 2 drachms Syrup of gum arabic.... 1 ounce Make 2 doses. Take first in morning, two hours after take dose of castor oil, and in half an hour the remaining dose.

VOMITING.

LATIN.	ENGLISH.
℞.—Ingluvin .... 1 drachm Acid hydrochlor dil...... 2 drachms Aq. dest................ 6 " Sig.—Teaspoonful every two or three hours.	℞.—Ingluvin .... 1 drachm Hydrochloric acid, diluted 2 drachms Water .... 6 " Teaspoonful every two or three hours.

WORMS (ROUND AND STOMACH).

LATIN.	ENGLISH.
℞.—Hyd. chlor. mite....... 10 grains Soda bicar............ 10 " Santonine .... 10 " Pv. rhei............... 10 " Mft. cht. No. VI. Sig.—One every three hours and then a purge.	℞.—Calomel .... 10 grains Bicarbonate of soda.... 10 " Santonine .... 10 " Rhubarb .... 10 " Make 6 powders. Take one every three hours and then a purge.

Children's Doses: Between one and two years, one-seventh of an adult dose; between two and six years, one-quarter; between six and twelve years, one-third; between twelve and fifteen years, one-half.

HOW TO MAKE LEADING PATENT MEDICINES.

SEIDLITZ POWDERS.

Soda et potas. tart.	2 drachms
Bicarbonate of soda	2 scruples
(in blue paper)	
Tartaric acid	35 grains
(in white paper)	

Dissolve contents of blue paper in half a pint of water, to which those of the white paper are added, and the whole is taken in a state of effervescence.

JAYNE'S EXPECTORANT.

Syrup of squills	2 ounces
Tincture of tolu	1½ ounces
Tincture of lobelia	1 drachm
Tincture of digitalis	1 drachm
Laudanum	2 drachms
Spirits of camphor	1 drachm
Wine of ipecac	2 drachms
Tartar emetic	2 grains

Dose: A teaspoonful every three or four hours. Used in coughs, colds, hoarseness, and so forth.

HELMBOLD'S BUCHU.

Buchu	½ ounce
Uva ursi	2½ drachms
Licorice	¼ ounce
Caramel	1 ounce
Ex. cubebs fld	5 drachms
Alcohol	4 ounces
Oil peppermint	1 drachm
Water, sufficient to make	24 ounces

Dose: A teaspoonful four times a day. Used in affections of the kidneys and bladder.

SCHENCK'S PULMONIC SYRUP.

Wormwood	1 ounce
Catnip	1 ounce
Tansy	1 ounce
Hyssop	1 ounce
Hoarhound	1 ounce
Hops	1 ounce
Chamomile	1 ounce
Comfrey	1 ounce
Senegæ	1 ounce
Elecampane	1 ounce

Boil with water sufficient to make two quarts and add gum arabic 3 ounces, licorice 3 ounces, and add 1 turnip, sugar 6 pounds, brandy 16 ounces.

Dose: One dessertspoonful three or four times a day. Used in incipient consumption, bronchitis, and so forth.

SAINT JACOB'S OIL.

Contains water, ether, alcohol, aconite and red-coloring matter.

Used as an external application in rheumatism, sprains, bruises, and so forth.

SAGEE'S CATARRH REMEDY.

Sodii salicylat	2 drachms
Sodii biborat	3 drachms
Glycerine	4 drachms
Water	Sufficient to make 4 ounces

A dessertspoonful in a pint of water. Mix, and use with atomizer in nostrils three or four times a day. Used for catarrh, rhinitis, and so forth.

BAY RUM.

Oil of bay	4 drachms
Oil of orange	15 minims
Oil of pimento	15 minims
Alcohol	40 ounces
Water	25 ounces

Mix oils with alcohol, add water, set aside for eight days and filter.

GREEN'S AUGUST FLOWER.

Rhubarb	6 drachms
Golden seal	1½ drachms
Aloes	1 drachm
Carbonate potash	16 grains
Peppermint	2 drachms
Cayenne pepper	5 grains
Alcohol	3 ounces
Sugar	8 ounces
Water	10 ounces

Macerate the drugs in alcohol eight days, strain and add the water to make eight pints.

Dose: A teaspoonful four times a day. Used in liver diseases, constipation, and so forth.

WARNER'S SAFE CURE.

Powdered saltpetre	2 drachms
Liverwort	1 ounce
Alcohol	2 ounces
Glycerine	1½ ounces
Spirits wintergreen	40 drops
Water	8 ounces

Dose: A dessertspoonful three times a day. Used in kidney and bladder diseases.

HOP BITTERS.

Hops	4 ounces
Orange peel	2 ounces
Dandelion	2 ounces
Buchu	1 ounce
May-apple	½ ounce
Sugar	16 ounces
Alcohol	16 ounces
Water	3 pints

Dose: A tablespoonful three or four times a day.

IODIA.

Stillingia root	4 ounces
Helonias root	2 ounces
Saxafraga root	5 ounces
Menispermum root	5 ounces
Aromatic powder	5 drachms
Iodide of potash	3½ drachms
Phos. iron (to each teaspoonful)	4½ drachms

A teaspoonful for dose, three or four times a day. Used as an alterative or blood purifier.

SYRUP OF FIGS.

Composed of juice of figs, Alexandria senna, aromatics.

A teaspoonful as occason requires. Used as a simple, safe and reliable laxative.

WINE OF PEPSIN.

Pepsin	3 drachms
Sherry wine	6½ ounces
Glycerine	1½ ounces
Tartaric acid	5 grains

A teaspoonful after meals. Used for dyspepsia, indigestion, attacks of colic, and so forth.

SCOTT'S EMULSION.

Each ounce represents

Cod-liver oil	50 per cent.
Hypophosphite of lime	6 grains
Hypophosphite of soda	3 grains

Dose: A tablespoonful three or four times a day. Used in consumption and wasting diseases.

COMPOUND SYRUP OF WHITE PINE.

Each ounce represents

White pine bark	30 grains
Wild cherry bark	30 grains
Spikenard	4 grains
Balm gilead buds	5 grains
Blood root	3 grains
Sassafras bark	2 grains
Sulphate of morphia	3-16 grain
Chloroform	4 minims

Dose: A teaspoonful three or four times daily. Used for coughs, colds, asthmatic affections, hoarseness, and so forth.

HORSFORD'S ACID PHOSPHATE.

Contains phosphate lime, phosphate magnesia, phosphate potash, phosphate iron.

Dose: Ten to fifteen drops in wineglass of water every three or four hours. Used in cases of dyspepsia, indigestion, and so forth.

VIN MARIANI.

Fresh coca leaves	3 ounces
Port wine	1 pint

Dose: A wineglass three times a day. Used in acid digestion—fortifies and strengthens the system.

PEPTO-MANGANI—TONIC.

Each tablespoonful contains

Peptonate of iron	1½ grains
Peptonate of manganese	¼ grain

Used in anemia or where the blood is deficient in red corpuscles. Dose: A teaspoonful three or four times a day.

PILL. CASCARA CATHARTIC.

Cascarin	12½ grains
Aloin	12½ grains
Podophyllin	8 grains
Ex. Belladonna	6 grains
Strychnine	1 grain
Gingerine	6 grains

Make fifty pills. Take two pills at commencement, then follow with one pill every two or three hours until relieved.

ONE HUNDRED STANDARD PATENT MEDICINES.

ABBEY'S EFFERVESCENT SALT.
For sluggish liver and attendant disorders.

ARLINGTON CHEMICAL CO.'S PEPTONOIDS,
In liquid and powder forms. A food in convenient forms for weak digestion.

AUBERGIER'S LACTUCARIUM SYRUP AND LOZENGES.
For coughs, colds, hoarseness, and so forth.

ANTIPHLOGISTINE.
A clay in ointment form for absorbing inflammation.

AYER'S CATHARTIC PILLS.
Laxative, cathartic, and so forth.

AYER'S CHERRY PECTORAL.
For various affections of the lungs and throat.

AYER'S SARSAPARILLA.
For complaints arising from impurities of the blood.

BEECHAM'S PATENT PILLS.
For torpid liver, indigestion, and so forth.

BLAIR'S RHEUMATIC AND GOUT PILLS.
For rheumatism, gout, and so forth.

BRANDRETH'S PILLS.
Laxative, cathartic, sour stomach, and so forth.

BROWN'S BRONCHIAL TROCHES.
For coughs, colds, hoarseness and bronchial irritation.

BULL'S COUGH SYRUP.
For coughs, colds, and so forth.

CARTER'S LITTLE LIVER PILLS.
For biliousness, torpid liver, constipation, sallow skin, and so forth.

CASCARETS.
A candy cathartic for chronic constipation.

CASTORIA.
For assimilating the food and regulating the stomach and bowels of infants and children.

CROSBY'S VITALIZED PHOSPHITES.
Brain and nerve food. Useful in the deficient mental and bodily growth of infants and children.

CUTICURA RESOLVENT.
For purifying the blood.

CUTICURA.
A salve for eruptions of the skin and unrivaled as a hair dressing.

DELAVAU'S WHOOPING-COUGH REMEDY.
For whooping-cough and croup.

DENTACURA.
An antiseptic and detergent tooth paste.

ELY'S CREAM BALM.
For catarrh, catarrhal deafness, hay fever and cold in the head.

EMERSON'S BROMO-SELTZER.
For nervous headache, sleeplessness, over fatigue, and so forth.

ENTONA (HEALTH FOOD CO.'S WHITE WHEAT GLUTEN SUPPOSITORIES).
For hemorrhoids and constipation.

FAIRCHILD'S PANOPEPTON.
A food composed of beef and wheat in soluble and absorbable form.

FELLOW'S COMPOUND SYRUP OF HYPOPHOSPHITES.
An ideal reconstructive tonic.

GLYCO-THYMOLINE (KRESS).
An alkaline antiseptic and non-irritating solution.

GRAY'S GLYCERINE TONIC COMPOUND.
For diseases of chest and throat. Useful where stomach is weak.

GREEN'S AUGUST FLOWER.
For dyspepsia in all forms.

GUDE'S PEPTO-MANGAN.
A widely-known and prescribed tonic.

H. H. H. MEDICINE.
A liniment for general purposes for man or beast.

HAGEE'S COD-LIVER OIL CORDIAL.
A tonic stimulant in palatable form.

HANCE BROS. AND WHITE'S PHENOL-SODIQUE.
An antiseptic and disinfectant for all purposes.

HAINE'S GOLDEN SPECIFIC.
Recommended for intemperance.

HEISKELL'S OINTMENT.
For tetter, erysipelas and eruptions of the skin.

HEMABALOIDS.
A blood enricher and alterative.

HEMAPEPTONE.
Organic iron. A useful tonic.

HOFF'S EXTRACT OF MALT.
A stimulant and aid to weak digestion.

HOLMES' FRAGRANT FROSTILLA.
A useful toilet article.

HOOD'S SARSAPARILLA.
An alterative, tonic and blood purifier.

HUMPHREY'S MARVEL OF HEALING.
A pure distillate of witch-hazel recommended for household and stable uses.

HUMPHREY'S WITCH HAZEL OIL.
A hemorrhoidal and general salve.

JAYNE'S ALTERATIVE.
As it is called a good alterative.

JAYNE'S CARMINATIVE BALSAM.
For dysentery, diarrhœa, cholera morbus, sick headache, etc

JAYNE'S EXPECTORANT.
For coughs, colds, bronchial affections and irritations.

JAYNE'S SANATIVE PILLS.
For constipation and disorders of the liver.

JAYNE'S TONIC VERMIFUGE.
For removal of worms and in aid to digestion.

JOHNSON'S DIGESTIVE TABLETS.
For dyspepsia and indigestion.

JUNIPER TAR (WHITEHURST'S).
For colds, cough, irritations of bronchial tubes and mucous membranes.

KEASBEY AND MATTISON CO.'S ALKALITHIA.
A handy effervescent salt for all forms of rheumatism.

KEASBEY AND MATTISON CO.'S BROMO-CAFFEINE.
A handy effervescent salt for brain workers.

KILMER'S SWAMP ROOT.
For acute and chronic kidney and liver disease.

MALTINE.
A concentrated extract of malted barley, wheat and oats. An efficient aid to sound and healthy digestion.

LACTOPEPTINE.
An aid to perfect digestion. In powder, liquid or tablet form.

LAVILLE'S GOUT REMEDY.
For rheumatic and gouty disorders.

LAXATIVE BROMO-QUININE TABLETS.
A remedy for coughs, colds and headache.

LISTERINE.
A widely used antiseptic, prophylactic and disenfectant.

NATURAL CARLSBAD SALT.
An effervescent salt known as nature's aperient.

OMEGA OIL.
A household liniment for aches, pains and soreness.

OSGOOD'S INDIA CHOLAGOGUE.
For malaria, chills and fever, and so forth.

PAINE'S CELERY COMPOUND.
A nerve tonic, active alterative, laxative and diuretic.

PERUNA.
A tonic used in catarrhal, dyspeptic and kidney disorders.

PHILLIPS' EMULSION OF COD-LIVER OIL.
A valuable remedy combined with wheat phosphates.

PHILLIPS' MILK OF MAGNESIA.
A mild laxative and an excellent dentrifice.

PHOSPHAGON.
A natural nerve nutrient.

PIERCE'S FAVORITE PRESCRIPTION.
For chronic weaknesses of women.

PIERCE'S GOLDEN MEDICAL DISCOVERY.
A remedy for chronic or lasting ailments.

PINKHAM'S VEGETABLE COMPOUND.
A remedy for diseases of women.

POND'S EXTRACT.
A reliable remedy for many purposes.

RADWAY'S READY RELIEF.
Used externally as a liniment and internally as a counter-irritant.

RESINAL.
An ointment for all forms of inflammations, eruptions and irritations of the skin.

RIPANS TABULES.
For stomach troubles.

RUSSELL EMULSION.
A tonic composed of mixed fats or oils.

SAGE'S CATARRH REMEDY.
For catarrh, hay fever, influenza, and so forth.

SANITOL.
A liquid, paste or powder for the teeth.

SANTAL-MIDY CAPSULES.
For venereal diseases.

SCHENCK'S MANDRAKE PILLS.
For biliousness and liver complaint.

SCHENCK'S PULMONIC SYRUP.
For consumption, diseases of the lungs and respiratory organs.

SCHENCK'S SEAWEED TONIC.
For dyspepsia.

SCOTT'S EMULSION OF COD-LIVER OIL.
For pulmonary diseases, coughs, colds and general debility.

SHEFFIELD'S CREAM DENTIFRICE.
A paste for cleansing the teeth.

SLOAN'S LINIMENT.
Known as the "Killer of Pain."

SLOCUM'S COLT'S FOOT EXPECTORANT.
For coughs, colds, influenza, and so forth.

SLOCUM'S OZOMULSION.
For throat, chest and lung troubles, a flesh and strength producer.

SLOCUM'S PSYCHINE.
For disorders of throat and lungs.

SOZODONT.
For preserving, cleansing the teeth and hardening the gums.

STEARN'S WINE OF COD-LIVER OIL.
A palatable compound of cod-liver oil and iron.

STUART'S DYSPEPSIA TABLETS.
For stomach and intestinal indigestion or dyspepsia.

SWAIM'S PANACEA.
A very old and widely known blood purifier.

SWAYNE'S OINTMENT.
For tetter, itch, ring-worm and eruptions of the skin.

SWAYNE'S PANACEA.
For all forms of blood humors.

SWIFT'S SPECIFIC.
A blood purifier for syphilitic disorders.

SYRUP OF FIGS.
For habitual constipation.

TARRANT'S SELTZER APERIENT.
For indigestion, headache and constipation.

THYMOZONE.
An antiseptic and prophylactic for internal and external uses.

VAPO-CRESOLENE.
A remedy for whooping-cough, asthma, catarrh, and so forth.

VIN MARIANA.
A coca wine tonic.

WAMPOLE'S PREPARATION OF COD-LIVER OIL.
In a tasteless form; tonic for all wasting diseases.

WARNER'S BROMO SODA.
For headache, sleeplessness, and so forth.

WARNER'S SAFE CURE.
For kidney and liver diseases.

WAMPOLE'S ANTISEPTIC SOLUTION.
A valuable antiseptic and germicide.

WALTHER'S PEPTONIZED PORT.
For all forms of dyspepsia, mal-nutrition, and so forth.

WILLIAMS' PINK PILLS.
A blood builder and nerve tonic.

WYETH'S BEEF, IRON AND WINE.
A nutritive tonic for impaired nutrition, impoverished blood and general debility.

APPROVED PATENT FOODS FOR INFANTS, INVALIDS AND THE AGED.

ALLENBURY'S FOODS.
No. 1, milk food for first three months.
No. 2, milk food for second three months.
No. 3, malted food after six months.

ANGLO-SWISS MILK (SWISS BRAND).
Recommended very highly as an infant's food, being an unchangeable brand.

BENGER'S FOOD.
For infants, invalids and the aged.

BLAIR'S PREPARED WHEAT FOOD.
Recommended for all ages.

CARNRICK'S LACTO-PREPARATA.
The first food; resembling human milk.

CARNRICK'S SOLUBLE FOOD.
Usually recommended after infancy.

CARNRICK'S KUMYSGEN.
Called the "Ideal Food." For any age where digestion is weak.

EAGLE CONDENSED MILK.
Recommended as a general household food.

ESKAY'S ALBUMENIZED FOOD.
Used from infancy to old age. Highly endorsed by physicians.

FAIRCHILD'S PEPTOGENIC MILK POWDER.
For modifying cow's milk and rendering it a readily assimilated food.

HORLICK'S DIASTOID.
A diastasic dry extract of malt. In both powder and tablet forms. A valuable addition to milk, and so forth, to aid digestion.

HORLICK'S FOOD.
For infants and invalids.

HORLICK'S MALTED MILK.
A widely known food for all ages. Being used as a powder and lunch tablet. Can justly be called the staff of life.

HUBBELL'S PREPARED WHEAT.
Made from wheat flour and baked.

IMPERIAL GRANUM.
From wheat. Useful as an infant's food and in all gastric and enteric fevers.

JUST'S DIETETIC CEREAL FOOD.
For infants, invalids, and so forth.

KEASBEY AND MATTISON CO.'S INFANTS' FOOD.
Made from malted grains.

LIEBE'S SOLUBLE FOOD.
For infants, invalids, and so forth.

MELLIN'S FOOD.
Widely known as a reliable food for infants, and so forth. The manufacturers point with pride to its "heavy-weights."

MOXEY'S CEREALINA.
A food known as a preparation of debranned wheat from the formula of Dr. John G. Moxey.

NESTLE'S MILK FOOD.
Recommended by some eminent physicians of Europe as an ideal food for infants.

NESTLE'S SWISS MILK.
Recommended from infancy to old age.

RIDGE'S FOOD.
For infants, invalids and all ages.

ROBINSON'S PATENT BARLEY.
An infant's food and highly useful for making sick-room dainties.

TAYLOR'S BERMUDA ARROWROOT.
Known for many ages past as the baby's own.

WAMPOLE'S MILK FOOD.
Made from malted cereals, beef and milk. Used in powdered form for invalids and infants and in tablet form as a luncheon dainty.

WELLS, RICHARDSON AND CO.'S CEREAL MILK.
Cereal grains. Known as a predigested food. Recommended by physicians generally.

WELLS, RICHARDSON AND CO.'S LACTATED FOOD.
Resembling human milk and a widely-known infants', and so forth, food.

WYETH'S PREPARED FOOD.
Malted milk and cereals. Recommended for all ages by eminent physicians and produced by a laboratory renowned for reliable products.

Foods in liquid forms, being valuable additions and adjuncts for the sickroom.

Used in drop doses for infants to teaspoonfuls for advancing years.

ANKER'S BOUILLON CAPSULES.
Beef extract in handy and convenient form.

ARMOUR'S BEEF EXTRACT AND VEGETABLE TABLETS.

BOVININE.
From formulæ of Dr. Bush, valuable in all ages.

FAIRCHILD'S PEPTONIZING TUBES.
A powder used in peptonizing milk and foods for the sick.

HANSEN'S JUNKET TABLETS.
The handy sickroom dainty makers. Eagerly taken by young and old.

MELLIN'S FOOD BISCUITS.
Mellin's food in compact, convenient form.

MURDOCK'S LIQUID FOOD.
Beef, mutton and fruits. Strength producer.

MULFORD'S PRE-DIGESTED BEEF.
Recommended by physicians generally as the invalid's helper.

PERFECTION LIQUID FOOD.
A predigested beef and concentrated extract of malt suggested by Dr. Guernsey.

SOMATOSE AND SOMATOSE BISCUIT.
A beef extract in powdered form. The biscuit admirable for the well man's luncheon.

TROPHONINE.

A highly nutritious liquid food, easily absorbed and has revived the patient when others have failed.

VALENTINE'S BEEF JUICE.

Readily mixed in cold water and free from objectionable properties.

WAMPOLE'S LIQUID WHEAT.

A brain and nerve food. Beneficial in promoting growth in children and readily enters into the building up of any deficiencies.

WYETH'S BEEF JUICE.

A carefully made extract of beef, easily administered and assimilated.

ENTERING UPON MARRIAGE.

Courtship.—The object of courtship should be to study dispositions and affinities, also mental and physical conditions. Falling in love first and then courting is substituting blindness for sight, folly for discretion.

Association.—Both young men and women should mingle freely in a social way before entering on courtship, for genuine courtship implies more or less direction of attention to a single person, and therefore a measure of social exclusion.

Length of Courtship.—Courtship should never be hasty. It should be prolonged until both parties are satisfied of the mutual existence of the qualities which will conduce to conjugal happiness.

Engagement.—Engagements should, as a rule, be brief. The spectacle of engaged couples trying each other's patience for years by delaying marriage is a pitiable one. The contract entered into becomes a mortgage without interest.

Affinity.—Affinity differs from love. It may exist in the marriage estate, and be productive of comfort and happiness in the absence of the sentiment of love. Yet it cannot be said that the converse of this ever, or, at least, frequently is true. Affinity rests on a variety of causes.

Mental Condition.—Mental affinity is necessary to married happiness. An ignorant man or woman should not mate with one of education, nor vice versa. It cannot be said that such a union is devoid of all certainty as to happiness, but the chances for unhappiness are too great to risk.

Marriageable Age.—In temperate climates the proper marriageable age is not reached before maturity, when nature has completed and perfected the organic structure; that is to say, marriage may be entered upon with propriety at from twenty to twenty-five years of age. Earlier marriage is likely to entail injury to health and comfort upon the wife; while marriage at a late period in life is apt to lead to puny and sickly children. Any material disproportion in the ages of man and wife should be avoided.

Marriage and Longevity.—It is a definitely ascertained result of marriage that it lengthens life, where the estate is entered upon with discretion, and conducted in a proper manner.

Ill Health and Marriage.—The marriage of unhealthy persons is liable to lead to distressing consequences. Hereditary transmission of diseases enters into the moral as well as physical order of things. This is especially true of consumptives and scrofulous people, who, as a rule, are prolific. Even if the exact hereditary taint does not pass to the offspring, there is liability to a train of the common diseases which mar comfort and destroy life.

Money and Marriage.—Marriages of convenience, that is, for money, ease or distinction, are to be deprecated. The fortune-hunter, pure and simple, is never a disinterested lover, nor a considerate life partner. The spirit of mercenariness, which prompts an alliance for convenience, grows by what it feeds upon, and is an enemy to conjugal harmony and happiness.

Religion.—Likeness in religious sentiment is necessary to conjugal happiness. It is not necessary that the man and wife should belong to the same church. What is meant is that there should be tolerance of the religious views and pious sentiments of each other. The indifferent man or woman, the intolerant, the mocking, the profane may speedily wreck the happiness, and even health, of a partner, for there is no sentiment that lies deeper, or is more sensitive, than that of piety and religion.

Tastes.—These should be so nearly akin in man and wife as to assure adaptability and accord. When a wife sees beauty in an object and a husband only ugliness, or when one is tidy and the other careless, there are constant grounds for reproachful differences, ending in unhappiness.

Mutuality.—In general, mutuality in the conjugal estate is a sharpener of love and respect, a helper to the further and fuller exercise of whatever ripens and completes manhood and womanhood, and conduces to the perfection of the estate.

Physical Characteristics.—Affinity, adaptability and all characteristics of a mental, moral and sentimental nature, which are generally recognized as essential to married happiness, do not necessarily include physical likenesses. While two unhealthy people may not marry for fear of perpetuating disease in their offspring, such fear may not prevent the alliance of a sturdy constitution with a delicate one. Oftentimes marriage improves a delicate organization; at least, there is a possibility of the robust man or woman so modifying the condition of offspring as to eliminate hereditary disease tendencies, and produce a healthy generation.

Physical Forms.—Intercourse in the lower animals and in plants is so regulated by experts as to lead to great improvements in the species. This is equally possible in mankind. The tendency to over-proportion in male or female lines may be corrected by marriage of a large partner with one of small size. The same is true of complexions. The brunette may well marry with the blonde, with the hope of modifying parental complexions in offsprings. Some theorists carry this matter much further, and say that those having the same color of eyes should not marry; and they say the same of the hair. So large-boned people should marry those of small bones; beauty should marry homeliness; nervous people should marry their opposites; those of strong facial contour should marry those with less decided physiognomies; and so on; all, of course, with the hope of curing in their posterity what may pass for defects in the parents; or, if not defects, at least so modifying physical forms as to produce a more satisfactory form.

The Final Resolve.—Courtship has made the contemplated partners acquainted with one another. They have talked over their aims and ambitions. They have plighted troths and sealed a contract. Among the Hebrews this was the equivalent of marriage. The final resolve should, therefore, be to carry into and through the marriage estate all those high agreements which love prompted, hope cherished, and thoughtful consideration of the future suggested.

THE MARRIAGE ESTATE.

THINGS YOUNG WIVES SHOULD KNOW.

THE PERIOD OF CONCEPTION.

Woman's Courage.—Courage is assigned to man—to woman it is due. Follow her steps from the time she enters the arena of married life, study each line—each shading and its effect—as though an artist with magic brush had depicted on canvas the hidden mysteries of life's various phases, and the result will be startling to those who have been but casual observers in the past. The courage and sublimity of woman's nature is inherent, descending through ages, thus becoming a fixed moral quantity of woman in her kind.

Courage Illustrated.—Courage in woman is illustrated by the fortitude with which she bears her children, the cheerfulness with which she undertakes their moral and physical training, and the patience and perseverance she shows when called to tend by their sick-bed through the long, weary hours, days or weeks of their illness. All parents desire to bring into the world good, bright and healthy offspring without pain. Can it be accomplished?

Propagating Likes.—Sexual emotion is absolutely necessary to conception. The impress is made at the moment. Every quality of mind or body which is dominant then will undoubtedly determine the fate of the offspring. How imperatively necessary is it then, at that moment, to permit nothing but the most pleasant fancies to occupy the mind, namely, the thought of those actions and things which is most desirable to reappear in children.

Natural Harmony.—Life itself should be a sober hilarity; all the senses should be in harmony with nature, and the heart should be ready to respond at the right period with a holy fidelity to the mysterious demands of the love which unites existences, and in the homes of earth educate beings to dwell in heaven.

WILL THE BABE BE BOY OR GIRL?

Function of the Ovary.—The ovary is undoubtedly the predominant factor in this respect. The only means by which the determination of sex can be influenced is by the nutritional processes in the ovary. Disturbances in the ovary in this line, dating from fetal life, seem to determine a preponderance of male ova, while abundant normal nutritional processes favor the production of females.

We have observed, in our experience, the evidence of nutritional disturbances, as a number of mothers of boys gave birth to girls after symptoms of diabetes were first noticed.

Emotion and Secretion.—Cases of this kind might be multiplied *ad libitum,* but such instances are not needed to demonstrate that the feelings influence every fibre of our frame. The soul pervades every element of our bodies, and "in every nerve it thrills with pleasure, or grows mad with pain." The direct influence of the immortal agent over the mortal organism is beautifully demonstrated by the effects of emotion on secretion.

Mental Association.—Hence, at such a time, how important that only the most pleasant and calming recollections should pervade the mind. This appetite, which is not essential to the life of the individual, is mainly dependent on mental associations for its activity, and should be controlled by moral principle.

CAN PARENTS CONTROL THE SEX OF THE CHILD?

Interest in the Subject.—The above subject has for a long time deeply interested the scientists, not only of Europe, but also our own country, and various experiments have been made to endeavor to found the same upon fact instead of theory.

Results of Investigation.—These experiments were at first made in the interest of science alone, but the raisers of cattle and horses, seeing an increase of gain to themselves, quickly took hold of the subject and have endeavored to reap the advantages therefrom.

The following results, which have been carefully kept record of, elucidate the following:

1st. That the offspring of a cow or mare, if young, and the male older and in good health, was a male.

2d. If the female is mature in age, healthy and strong, the male younger and deficient in copulative strength, the offspring was a female.

3d. That when both male and female were of mature age and healthy, the offspring was about equal, male or female.

4th. If the female is old and the male young, the offspring will be male.

5th. If the male is old, with the female younger, the offspring will be female.

6th. If female was ill fed or run down by labor, and male well fed and in vigor; offspring, male.

7th. If the female was well fed and rested, and male ill fed and worked; offspring, female.

8th. That the offspring would be male or female as regards the manner in which they were treated, fed, etc

Conclusions.—From the above we would draw the following conclusions: Men having physical and procreative propensities similar to animals, the genital function is first to feel disturbance of the nervous system, as the top of the tree first shows that the roots are not properly nourished. The function of generation being the last to be developed has nothing directly depending on or issuing from it, it is a twig and not a main branch, like the stomach and brain; it is a periodic function, capable of long intervals of inactivity, and the rest of the body cannot only survive; but be in good condition for a time at least when this function is absolutely dead.

When a Male Child is Desired.—The husband should partake of good substantial food. Exercise in open air; indulge in light literature; keep up a glow of spirits; abstain from indulgence for a short time previous to the procreative period. During this period the wife should abstain from animal foods, living mostly on vegetables and farinaceous articles of diet; exercise daily to almost fatigue, take the following treatment and pass a portion of her time with females older than herself. The following pill should be taken, one three times daily for several weeks:

Extract	Hyosciamus	½	grain
"	Valerian	1	"
"	Sumbul	1	"
"	Asafœtida	1	"

When a Female Child is Desired.—Exactly the opposite course should be pursued—the woman should indulge in the most stimulating food—but should not indulge her passions, reserving her whole vigor for the desired time. The male should indulge in violent physical exercise to fatigue, and morning and night take sitz baths of cold rock-salt water.

Care of the Passions.—Abuse of the passions disturbs all the processes of life; a brutal kind of vigor in those who are reckless, but a soul that condemns its own conduct, is sure to produce disorders of the nervous system; the family of reflex centers, the brain, the stomach, the genital system; between these, messengers of evil or of good are ever passing in sleeping and in working hours; to touch one is to touch all.

TABLE OF CONCEPTION AND BARREN PERIODS.

The following table, showing the possible periods of conception and barrenness after the recurrence of each mensis, or monthly, will prove helpful to married women seeking rational means of regulating procreative conduct. B stands for beginning of each period—monthly, conceptional and barren—and E for the ending of the same.

MONTHLIES.		Period of Probable Conception.		Probable Barren Period.		Period of Probable Conception.	
B.	E.	B.	E.	B.	E.	B.	E.
Jan.... 1—	3	Jan.... 4—	16	Jan.... 17—	22	Jan..... 23—	at next monthly.
“ .... 2—	4	“ .... 5—	17	“ .... 18—	23	“ .. .. 24—	“ “ “
“ .... 3—	5	“ .... 6—	18	“ .... 19—	24	“ ..... 25—	“ “ “
“ .... 4—	6	“ .... 7—	19	“ .... 20—	25	“ ..... 26—	“ “ “
“ .... 5—	7	“ .... 8—	20	“ .... 21—	26	“ ..... 27—	“ “ “
“ .... 6—	8	“ .... 9—	21	“ .... 22—	27	“ ..... 28—	“ “ “
“ .... 7—	9	“ .... 10—	22	“ .... 23—	28	“ ..... 29—	“ “ “
“ .... 8—	10	“ .... 11—	23	“ .... 24—	29	“ ..... 30—	“ “ “
“ .... 9—	11	“ .... 12—	24	“ .... 25—	30	“ ..... 31—	“ “ “
“ .... 10—	12	“ .... 13—	25	“ .... 26—	31	Feb. .... 1—	“ “ “
“ . .. 11—	13	“ .... 14—	26	“ .... 27—	Feb. 1	“ ..... 2—	“ “ “
“ .... 12—	14	“ .... 15—	27	“ .... 28—	“ 2	“ ..... 3—	“ “ “
“ .... 13—	15	“ .... 16—	28	“ .... 29—	“ 3	“ ..... 4—	“ “ “
“ .... 14—	16	“ .... 17—	29	“ .... 30—	“ 4	“ ..... 5—	“ “ “
“ .... 15—	17	“ .... 18—	30	“ .... 31—	“ 5	“ ..... 6—	“ “ “
“ .... 16—	18	“ .... 19—	31	Feb. ... 1—	6	“ ..... 7—	“ “ “
“ .... 17—	19	“ .... 20—	Feb. 1	“ .... 2—	7	“ ..... 8—	“ “ “
“ .... 18—	20	“ .... 21—	“ 2	“ .... 3—	8	“ ..... 9—	“ “ “
“ .... 19—	21	“ .... 22—	“ 3	“ .... 4—	9	“ ..... 10—	“ “ “
“ .... 20—	22	“ .... 23—	“ 4	“ .... 5—	10	“ ..... 11—	“ “ “
“ .... 21—	23	“ .... 24—	“ 5	“ .... 6—	11	“ ..... 12—	“ “ “
“ .... 22—	24	“ .... 25—	“ 6	“ .... 7—	12	“ ..... 13—	“ “ “
“ .... 23—	25	“ .. . 26—	“ 7	“ .... 8—	13	“ ..... 14—	“ “ “
“ .... 24—	26	“ .... 27—	“ 8	“ .... 9—	14	“ ..... 15—	“ “ “
“ .... 25—	27	“ .... 28—	“ 9	“ .... 10—	15	“ ..... 16—	“ “ “
“ .... 26—	28	“ .... 29—	“ 10	“ .... 11—	16	“ ..... 17—	“ “ “
“ .... 27—	29	“ .... 30—	“ 11	“ .... 12—	17	“ ..... 18—	“ “ “
“ .... 28—	30	“ .... 31—	“ 12	“ .... 13—	18	“ ..... 19—	“ “ “
“ .... 29—	31	Feb. ... 1—	13	“ .... 14—	19	“ ..... 20—	“ “ “
“ .... 30—	Feb. 1	“ .... 2—	14	“ .... 15—	20	“ ..... 21—	“ “ “
“ .... 31—	“ 2	“ .... 3—	15	“ .... 16—	21	“ ..... 22—	“ “ “
Feb. ... 1—	3	“ .... 4—	16	“ .... 17—	22	“ ..... 23—	“ “ “
“ .... 2—	4	“ .... 5—	17	“ .... 18—	23	“ ..... 24—	“ “ “
“ .... 3—	5	“ .... 6—	18	“ .... 19—	24	“ ..... 25—	“ “ “
“ .... 4—	6	“ .... 7—	19	“ .... 20—	25	“ ..... 26—	“ “ “
“ .... 5—	7	“ .... 8—	20	“ .... 21—	26	“ ..... 27—	“ “ “
“ .... 6—	8	“ .... 9—	21	“ .... 22—	27	“ ..... 28—	“ “ “
“ .... 7—	9	“ .... 10—	22	“ .... 23—	28	Mar..... 1—	“ “ “
“ .... 8—	10	“ .... 11—	23	“ .... 24—	Mar. 1	“ ..... 2—	“ “ “

MONTHLIES.		Period of Probable Conception.		Probable Barren Period.		Period of Probable Conception.	
B.	E.	B.	E.	B.	E.	B.	E.
Feb.... 9—	11	Feb.... 12—	24	Feb.... 25—Mar.	2	Mar..... 3—	at next monthly.
“ .... 10—	12	“ .... 13—	25	“ .... 26— “	3	“ ..... 4—	“ “ “
“ .... 11—	13	“ .... 14—	26	“ .... 27— “	4	“ ..... 5—	“ “ “
“ .... 12—	14	“ .... 15—	27	“ .... 28— “	5	“ ..... 6—	“ “ “
“ .... 13—	15	“ .... 16—	28	Mar.... 1—	6	“ ..... 7—	“ “ “
“ .... 14—	16	“ .... 17—Mar.	1	“ .... 2—	7	“ ..... 8—	“ “ “
“ .... 15—	17	“ .... 18— “	2	“ .... 3—	8	“ ..... 9—	“ “ “
“ .... 16—	18	“ .... 19— “	3	“ .... 4—	9	“ ..... 10—	“ “ “
“ .... 17—	19	“ .... 20— “	4	“ .... 5—	10	“ ..... 11—	“ “ “
“ .... 18—	20	“ .... 21— “	5	“ .... 6—	11	“ ..... 12—	“ “ “
“ .... 19—	21	“ .... 22— “	6	“ .... 7—	12	“ ..... 13—	“ “ “
“ .... 20—	22	“ .... 23— “	7	“ .... 8—	13	“ ..... 14—	“ “ “
“ .... 21—	23	“ .... 24— “	8	“ .... 9—	14	“ ..... 15—	“ “ “
“ .... 22—	24	“ .... 25— “	9	“ .... 10—	15	“ ..... 16—	“ “ “
“ .... 23—	25	“ .... 26— “	10	“ .... 11—	16	“ ..... 17—	“ “ “
“ .... 24—	26	“ .... 27— “	11	“ .... 12—	17	“ ..... 18—	“ “ “
“ .... 25—	27	“ .... 28— “	12	“ .... 13—	18	“ ..... 19—	“ “ “
“ .... 26—	28	Mar.... 1—	13	“ .... 14—	19	“ ..... 20—	“ “ “
“ .... 27—Mar.	1	“ .... 2—	14	“ .... 15—	20	“ ..... 21—	“ “ “
“ ... 28— “	2	“ .... 3—	15	“ .... 16—	21	“ ..... 22—	“ “ “
Mar.... 1—	3	“ .... 4—	16	“ .... 17—	22	“ ..... 23—	“ “ “
“ .... 2—	4	“ .... 5—	17	“ .... 18—	23	“ ..... 24—	“ “ “
“ .... 3—	5	“ .... 6—	18	“ .... 19—	24	“ ..... 25—	“ “ “
“ .... 4—	6	“ .... 7—	19	“ .... 20—	25	“ ..... 26—	“ “ “
“ .... 5—	7	“ .... 8—	20	“ .... 21—	26	“ ..... 27—	“ “ “
“ .... 6—	8	“ .... 9—	21	“ .... 22—	27	“ ..... 28—	“ “ “
“ .... 7—	9	“ .... 10—	22	“ .... 23—	28	“ ..... 29—	“ “ “
“ .... 8—	10	“ .... 11—	23	“ .... 24—	29	“ ..... 30—	“ “ “
“ .... 9—	11	“ .... 12—	24	“ .... 25—	30	“ ..... 31—	“ “ “
“ .... 10—	12	“ .... 13—	25	“ .... 26—	31	Apr..... 1—	“ “ “
“ .... 11—	13	“ .... 14—	26	“ .... 27—Apr.	1	“ ..... 2—	“ “ “
“ .... 12—	14	“ .... 15—	27	“ .... 28— “	2	“ ..... 3—	“ “ “
“ .... 13—	15	“ .... 16—	28	“ .... 29— “	3	“ ..... 4—	“ “ “
“ .... 14—	16	“ .... 17—	29	“ .... 30— “	4	“ ..... 5—	“ “ “
“ .... 15—	17	“ .... 18—	30	“ .... 31— “	5	“ ..... 6—	“ “ “
“ .... 16—	18	“ .... 19—	31	Apr.... 1—	6	“ ..... 7—	“ “ “
“ .... 17—	19	“ .... 20—Apr.	1	“ .... 2—	7	“ ..... 8—	“ “ “
“ .... 18—	20	“ .... 21— “	2	“ .... 3—	8	“ ..... 9—	“ “ “
“ .... 19—	21	“ .... 22— “	3	“ .... 4—	9	“ ..... 10—	“ “ “
“ .... 20—	22	“ .... 23— “	4	“ .... 5—	10	“ ..... 11—	“ “ “
“ .... 21—	23	“ ... 24— “	5	“ .... 6—	11	“ ..... 12—	“ “ “
“ .... 22—	24	“ .... 25— “	6	“ .... 7—	12	“ ..... 13—	“ “ “
“ .... 23—	25	“ .... 26— “	7	“ .... 8—	13	“ ..... 14—	“ “ “
“ .... 24—	26	“ .... 27— “	8	“ .... 9—	14	“ ..... 15—	“ “ “
“ .... 25—	27	“ .... 28— “	9	“ .... 10—	15	“ ..... 16—	“ “ “
“ .... 26—	28	“ ... 29— “	10	“ .... 11—	16	“ ..... 17—	“ “ “
“ ... 27—	29	“ .... 30— “	11	“ .... 12—	17	“ ..... 18—	“ “ “
“ ... 28—	30	“ .... 31— “	12	“ .... 13—	18	“ ..... 19—	“ “ “

MONTHLIES			Period of Probable Conception.			Probable Barren Period.			Period of Probable Conception.		
	B.	E.		B.	E.		B.	E.		B.	E.
Mar.	29—	31	Apr.	1—	13	Apr.	14—	19	Apr.	20—	at next monthly.
“	30—	Apr. 1	“	2—	14	“	15—	20	“	21—	“ “ “
“	31—	“ 2	“	3—	15	“	16—	21	“	22—	“ “ “
Apr.	1—	8	“	4—	16	“	17—	22	“	23—	“ “ “
“	2—	4	“	5—	17	“	18—	23	“	24—	“ “ “
“	3—	5	“	6—	18	“	19—	24	“	25—	“ “ “
“	4—	6	“	7—	19	“	20—	25	“	26—	“ “ “
“	5—	7	“	8—	20	“	21—	26	“	27—	“ “ “
“	6—	8	“	9—	21	“	22—	27	“	28—	“ “ “
“	7—	9	“	10—	22	“	23—	28	“	29—	“ “ “
“	8—	10	“	11—	23	“	24—	29	“	30—	“ “ “
“	9—	11	“	12—	24	“	25—	30	May	1—	“ “ “
“	10—	12	“	13—	25	“	26—	May 1	“	2—	“ “ “
“	11—	13	“	14—	26	“	27—	“ 2	“	3—	“ “ “
“	12—	14	“	15—	27	“	28—	“ 3	“	4—	“ “ “
“	13—	15	“	16—	28	“	29—	“ 4	“	5—	“ “ “
“	14—	16	“	17—	29	“	30—	“ 5	“	6—	“ “ “
“	15—	17	“	18—	30	May	1—	6	“	7—	“ “ “
“	16—	18	“	19—	May 1	“	2—	7	“	8—	“ “ “
“	17—	19	“	20—	“ 2	“	3—	8	“	9—	“ “ “
“	18—	20	“	21—	“ 3	“	4—	9	“	10—	“ “ “
“	19—	21	“	22—	“ 4	“	5—	10	“	11—	“ “ “
“	20—	22	“	23—	“ 5	“	6—	11	“	12—	“ “ “
“	21—	23	“	24—	“ 6	“	7—	12	“	13—	“ “ “
“	22—	24	“	25—	“ 7	“	8—	13	“	14—	“ “ “
“	23—	25	“	26—	“ 8	“	9—	14	“	15—	“ “ “
“	24—	26	“	27—	“ 9	“	10—	15	“	16—	“ “ “
“	25—	27	“	28—	“ 10	“	11—	16	“	17—	“ “ “
“	26—	28	“	29—	“ 11	“	12—	17	“	18—	“ “ “
“	27—	29	“	30—	“ 12	“	13—	18	“	19—	“ “ “
“	28—	30	May	1—	13	“	14—	19	“	20—	“ “ “
“	29—	May 1	“	2—	14	“	15—	20	“	21—	“ “ “
“	30—	“ 2	“	3—	15	“	16—	21	“	22—	“ “ “
May	1—	3	“	4—	16	“	17—	22	“	23—	“ “ “
“	2—	4	“	5—	17	“	18—	23	“	24—	“ “ “
“	3—	5	“	6—	18	“	19—	24	“	25—	“ “ “
“	4—	6	“	7—	19	“	20—	25	“	26—	“ “ “
“	5—	7	“	8—	20	“	21—	26	“	27—	“ “ “
“	6—	8	“	9—	21	“	22—	27	“	28—	“ “ “
“	7—	9	“	10—	22	“	23—	28	“	29—	“ “ “
“	8—	10	“	11—	23	“	24—	29	“	30—	“ “ “
“	9—	11	“	12—	24	“	25—	30	“	31—	“ “ “
“	10—	12	“	13—	25	“	26—	31	June	1—	“ “ “
“	11—	13	“	14—	26	“	27—	June 1	“	2—	“ “ “
“	12—	14	“	15—	27	“	28—	“ 2	“	3—	“ “ “
“	13—	15	“	16—	28	“	29—	“ 3	“	4—	“ “ “
“	14—	16	“	17—	29	“	30—	“ 4	“	5—	“ “ “
“	15—	17	“	18—	30	“	31—	“ 5	“	6—	“ “ “

MONTHLIES.		Period of Probable Conception.		Probable Barren Period.		Period of Probable Conception	
B.	E.	B.	E.	B.	E.	B.	E.
May.... 16—	18	May ... 19—	31	June .. 1—	6	June.... 7—at next monthly.	
" .... 17—	19	" .... 20—June	1	" .... 2—	7	" .... 8— "	" "
" .... 18—	20	" .... 21— "	2	" .... 3—	8	" .... 9— "	" "
" .... 19—	21	" .... 22— "	3	" .... 4—	9	" .... 10— "	" "
" .... 20—	22	" .... 23— "	4	" .... 5—	10	" .... 11— "	" "
" .... 21—	23	" .... 24— "	5	" .... 6—	11	" .... 12— "	" "
" .... 22—	24	" .... 25— "	6	" .... 7—	12	" .... 13— "	" "
" ... 23—	25	" .... 26— "	7	" .... 8—	13	" .... 14— "	" "
" ... 24—	26	" .... 27— "	8	" .... 9—	14	" .... 15— "	" "
" .... 25—	27	" .... 28— "	9	" .... 10—	15	" .... 16— "	" "
" ... 26—	28	" .... 29— "	10	" .... 11—	16	" .... 17— "	" "
" ... 27—	29	" .... 30— "	11	" .... 12—	17	" .... 18— "	" "
" ... 28—	30	" .... 31— "	12	" .... 13—	18	" .... 19— "	" "
" ... 29—	31	June... 1—	13	" .... 14—	19	" .... 20— "	" "
" .... 30—June	1	" .... 2—	14	" .... 15—	20	" .... 21— "	" "
" .... 31— "	2	" .... 3—	15	" .... 16—	21	" .... 22— "	" "
June... 1—	3	" .... 4—	16	" .... 17—	22	" .... 23— "	" "
" .... 2—	4	" .... 5—	17	" .... 18—	23	" .... 24— "	" "
" .... 3—	5	" .... 6—	18	" .... 19—	24	" .... 25— "	" "
" .... 4—	6	" .... 7—	19	" .... 20—	25	" .... 26— "	" "
" .... 5—	7	" .... 8—	20	" .... 21—	26	" .... 27— "	" "
" .... 6—	8	" .... 9—	21	" ... 22—	27	" .... 28— "	" "
" .... 7—	9	" .... 10—	22	" .... 23—	28	" .... 29— "	" "
" .... 8—	10	" .... 11—	23	" .... 24—	29	" .... 30— "	" "
" .... 9—	11	" .... 12—	24	" .... 25—	30	July.... 1— "	" "
" .... 10—	12	" .... 13—	25	" .... 26—July	1	" .... 2— "	" "
" .... 11—	13	" .... 14—	26	" .... 27— "	2	" .... 3— "	" "
" ... 12—	14	" .... 15—	27	" .... 28— "	3	" .... 4— "	" "
" .... 13—	15	" .... 16—	28	" .... 29— "	4	" .... 5— "	" "
" .... 14—	16	" .... 17—	29	" .... 30— "	5	" .... 6— "	" "
" .... 15—	17	" .... 18—	30	July ... 1—	6	" .... 7— "	" "
" .... 16—	18	" .... 19—July	1	" .... 2—	7	" .... 8— "	" "
" .... 17—	19	" .... 20— "	2	" .... 3—	8	" .... 9— "	" "
" .... 18—	20	" .... 21— "	3	" .... 4—	9	" .... 10— "	" "
" .... 19—	21	" .... 22— "	4	" .... 5—	10	" .... 11— "	" "
" .... 20—	22	" .... 23— "	5	" .... 6—	11	" .... 12— "	" "
" .... 21—	23	" .... 24— "	6	" .... 7—	12	" .... 13— "	" "
" .... 22—	24	" .... 25— "	7	" .... 8—	13	" .... 14— "	" "
" .... 23—	25	" ... 26— "	8	" .... 9—	14	" .... 15— "	" "
" .... 24—	26	" .... 27— "	9	" .... 10—	15	" .... 16— "	" "
" .... 25—	27	" .... 28— "	10	" .... 11—	16	" .... 17— "	" "
" .... 26—	28	" .... 29— "	11	" .... 12—	17	" .... 18— "	" "
" .... 27—	29	" .... 30— "	12	" .... 13—	18	" .... 19— "	" "
" .... 28—	30	July ... 1—	13	" .... 14—	19	" .... 20— "	" "
" .... 29—July	1	" .... 2—	14	" ... 15—	20	" .... 21— "	" "
" .... 30— "	2	" .... 3—	15	" ... 16—	21	" .... 22— "	" "
July.... 1—	3	" .... 4—	16	" .... 17—	22	" .... 23— "	"
" .... 2—	4	" .... 5—	17	" .... 18—	23	" .... 24— "	" "

MONTHLIES.		Period of Probable Conception.		Probable Barren Period.		Period of Probable Conception.	
B.	E.	B.	E.	B.	E.	B.	E.
July.... 3—	5	July ... 6—	18	July.... 19—	24	July..... 25—at next	monthly.
" .... 4—	6	" .... 7—	19	" .... 20—	25	" ..... 26— " "	"
" .. 5—	7	" .... 8—	20	" .... 21—	26	" ..... 27— " "	"
" .... 6—	8	" .... 9—	21	" .... 22—	27	" ..... 28— " "	"
" .... 7—	9	" .... 10—	22	" .... 23—	28	" ..... 29— " "	"
" .... 8—	10	" .... 11—	23	" .... 24—	29	" ..... 30— " "	"
" .... 9—	11	" .... 12—	24	" .... 25—	30	" ..... 31— " "	"
" .... 10—	12	" .... 13—	25	" .... 26—	31	Aug..... 1— " "	"
" .... 11—	13	" .... 14—	26	" .... 27—	Aug. 1	" ..... 2— " "	"
" .... 12—	14	" .... 15—	27	" .... 28— "	2	" ..... 3— " "	"
" .... 13—	15	" .... 16—	28	" .... 29— "	3	" ..... 4— " "	"
" .... 14—	16	" .... 17—	29	" .... 30— "	4	" ..... 5— " "	"
" .... 15—	17	" .... 18—	30	" .... 31— "	5	" ..... 6— " "	"
" .... 16—	18	" .... 19—	31	Aug.... 1—	6	" ..... 7— " "	"
" .... 17—	19	" .... 20—	Aug. 1	" .... 2—	7	" ..... 8— " "	"
" .... 18—	20	" .... 21— "	2	" .... 3—	8	" ..... 9— " "	"
" .... 19—	21	" .... 22— "	3	" .... 4—	9	" ..... 10— " "	"
" .... 20—	22	" .... 23— "	4	" .... 5—	10	" ..... 11— " "	"
" .... 21—	23	" .... 24— "	5	" .... 6—	11	" ..... 12— " "	"
" .... 22—	24	" .... 25— "	6	" .... 7—	12	" ..... 13— " "	"
" .... 23—	25	" .... 26— "	7	" .... 8—	13	" ..... 14— " "	"
" .... 24—	26	" .... 27— "	8	" .... 9—	14	" ..... 15— " "	"
" .... 25—	27	" .... 28— "	9	" .... 10—	15	" ..... 16— " "	"
" .... 26—	28	" .... 29— "	10	" .... 11—	16	" ..... 17— " "	"
" .... 27—	29	" .... 30— "	11	" .... 12—	17	" ..... 18— " "	"
" .... 28—	30	" .... 31— "	12	" .... 13—	18	" ..... 19— " "	"
" .... 29—	31	Aug.... 1—	13	" .... 14—	19	" ..... 20— " "	"
" .... 30—	Aug. 1	" .... 2—	14	" .... 15—	20	" ..... 21— " "	"
" .... 31— "	2	" .... 3—	15	" .... 16—	21	" ..... 22— " "	"
Aug.... 1—	3	" .... 4—	16	" .... 17—	22	" ..... 23— " "	"
" .... 2—	4	" .... 5—	17	" .... 18—	23	" ..... 24— " "	"
" .... 3—	5	" .... 6—	18	" .... 19—	24	" ..... 25— " "	"
" .... 4—	6	" .... 7—	19	" .... 20—	25	" ..... 26— " "	"
" .... 5—	7	" .... 8—	20	" .... 21—	26	" ..... 27— " "	"
" .... 6—	8	" .... 9—	21	" .... 22—	27	" ..... 28— " "	"
" .... 7—	9	" .... 10—	22	" .... 23—	28	" ..... 29— " "	"
" .... 8—	10	" .... 11—	23	" .... 24—	29	" ..... 30— " "	"
" .... 9—	11	" .... 12—	24	" .... 25—	30	" ..... 31— " "	"
" .... 10—	12	" .... 13—	25	" .... 26—	31	Sept..... 1— " "	"
" .... 11—	13	" .... 14—	26	" .... 27—	Sept. 1	" ..... 2— " "	"
" .... 12—	14	" .... 15—	27	" .... 28— "	2	" ..... 3— " "	"
" .... 13—	15	" .... 16—	28	" .... 29— "	3	" ..... 4— " "	"
" .... 14—	16	" .... 17—	29	" .... 30— "	4	" ..... 5— " "	"
" .... 15—	17	" .... 18—	30	" .... 31— "	5	" ..... 6— " "	"
" .... 16—	18	" .... 19—	31	Sept.... 1—	6	" ..... 7— " "	"
" .... 17—	19	" .... 20—	Sept. 1	" .... 2—	7	" ..... 8— " "	"
" .... 18—	20	" .... 21— "	2	" .... 3—	8	" ..... 9— " "	"
" .... 19—	21	" .... 22— "	3	" .... 4—	9	" ..... 10— " "	"

MONTHLIES.		Period of Probable Conception.		Probable Barren Period.		Period of Probable Conception.	
B.	E.	B.	E.	B.	E.	B.	E.
Aug.... 20—	22	Aug.... 23—Sept.	4	Sept..... 5—	10	Sept..... 11—	at next monthly.
" .... 21—	23	" .... 24— "	5	" .... 6—	11	" ..... 12— "	" "
" .... 22—	24	" .... 25— "	6	" .... 7—	12	" ..... 13— "	" "
" .... 23—	25	" .... 26— "	7	" .... 8—	13	" ..... 14— "	" "
" .... 24—	26	" .... 27— "	8	" .... 9—	14	" ..... 15— "	" "
" .... 25—	27	" .... 28— "	9	" .... 10—	15	" ..... 16— "	" "
" .... 26—	28	" .... 29— "	10	" .... 11—	16	" ..... 17— "	" "
" .... 27—	29	" .... 30— "	11	" .... 12—	17	" ..... 18— "	" "
" .... 28—	30	" .... 31— "	12	" .... 13—	18	" ..... 19— "	" "
" .... 29—	31	Sept.... 1—	13	" .... 14—	19	" ..... 20— "	" "
" .... 30—Sept.	1	" .... 2—	14	" .... 15—	20	" ..... 21— "	" "
" .... 31— "	2	" .... 3—	15	" .... 16—	21	" ..... 22— "	" "
Sept.... 1—	3	" .... 4—	16	" .... 17—	22	" ..... 23— "	" "
" .... 2—	4	" .... 5—	17	" .... 18—	23	" ..... 24— "	" "
" .... 3—	5	" .... 6—	18	" .... 19—	24	" ..... 25— "	" "
" .... 4—	6	" .... 7—	19	" .... 20—	25	" ..... 26— "	" "
" .... 5—	7	" .... 8—	20	" .... 21—	26	" ..... 27— "	" "
" .... 6—	8	" .... 9—	21	" .... 22—	27	" ..... 28— "	" "
" .... 7—	9	" .... 10—	22	" .... 23—	28	" ..... 29— "	" "
" .... 8—	10	" .... 11—	23	" .... 24—	29	" ..... 30— "	" "
" .... 9—	11	" .... 12—	24	" .... 25—	30	Oct..... 1— "	" "
" .... 10—	12	" .... 13—	25	" .... 26—Oct.	1	" ..... 2— "	" "
" .... 11—	13	" .... 14—	26	" .... 27— "	2	" ..... 3— "	" "
" .... 12—	14	" .... 15—	27	" .... 28— "	3	" ..... 4— "	" "
" .... 13—	15	" .... 16—	28	" .... 29— "	4	" ..... 5— "	" "
" .... 14—	16	" .... 17—	29	" .... 30— "	5	" ..... 6— "	" "
" .... 15—	17	" .... 18—	30	Oct..... 1—	6	" ..... 7— "	" "
" .... 16—	18	" .... 19—Oct.	1	" .... 2—	7	" ..... 8— "	" "
" .... 17—	19	" .... 20— "	2	" .... 3—	8	" ..... 9— "	" "
" .... 18—	20	" .... 21— "	3	" .... 4—	9	" ..... 10— "	" "
" .... 19—	21	" .... 22— "	4	" .... 5—	10	" ..... 11— "	" "
" .... 20—	22	" .... 23— "	5	" .... 6—	11	" ..... 12— "	" "
" .... 21—	23	" .... 24— "	6	" .... 7—	12	" ..... 13— "	" "
" .... 22—	24	" .... 25— "	7	" .... 8—	13	" ..... 14— "	" "
" .... 23—	25	" .... 26— "	8	" .... 9—	14	" ..... 15— "	" "
" .... 24—	26	" .... 27— "	9	" .... 10—	15	" ..... 16— "	" "
" .... 25—	27	" .... 28— "	10	" .... 11—	16	" ..... 17— "	" "
" .... 26—	28	" .... 29— "	11	" .... 12—	17	" ..... 18— "	" "
" .... 27—	29	" .... 30— "	12	" .... 13—	18	" ..... 19— "	" "
" .... 28—	30	Oct. .... 1—	13	" .... 14—	19	" ..... 20— "	" "
" .... 29—Oct.	1	" .... 2—	14	" .... 15—	20	" ..... 21— "	" "
" .... 30— "	2	" .... 3—	15	" .... 16—	21	" ..... 22— "	" "
Oct..... 1—	3	" .... 4—	16	" .... 17—	22	" ..... 23— "	" "
" .... 2—	4	" .... 5—	17	" .... 18—	23	" ..... 24— "	" "
" .... 3—	5	" .... 6—	18	" .... 19—	24	" ..... 25— "	" "
" .... 4—	6	" .... 7—	19	" .... 20—	25	" ..... 26— "	" "
" .... 5—	7	" .... 8—	20	" .... 21—	26	" ..... 27— "	" "
" .... 6—	8	" .... 9—	21	" .... 22—	27	" ..... 28— "	" "

MONTHLIES.		Period of Probable Conception.		Probable Barren Period.		Period of Probable Conception.	
B	E.	B.	E.	B.	E.	B.	E.
Oct. .... 7—	9	Oct. .... 10—	22	Oct. .... 23—	28	Oct. .... 29—at	next monthly.
" .... 8—	10	" .... 11—	23	" .... 24—	29	" ..... 30— "	" "
" .... 9—	11	" .... 12—	24	" .... 25—	30	" ..... 31— "	" "
" .... 10—	12	" .... 13—	25	" .... 26—	31	Nov..... 1— "	" "
" .... 11—	13	" .... 14—	26	" .... 27—Nov.	1	" ..... 2— "	" "
" .... 12—	14	" .... 15—	27	" .... 28— "	2	" ..... 3— "	" "
" .... 13—	15	" .... 16—	28	" .... 29— "	3	" ..... 4— "	" "
" .... 14—	16	" .... 17—	29	" .... 30— "	4	" ..... 5— "	" "
" .... 15—	17	" .... 18—	30	" .... 31— "	5	" ..... 6— "	" "
" .... 16—	18	" .... 19—	31	Nov. .. 1—	6	" ..... 7— "	" "
" .... 17—	19	" .... 20—Nov.	1	" .... 2—	7	" ..... 8— "	" "
" .... 18—	20	" .... 21— "	2	" .... 3—	8	" ..... 9— "	" "
" .... 19—	21	" .... 22— "	3	" .... 4—	9	" ..... 10— "	" "
" .... 20—	22	" .... 23— "	4	" .... 5—	10	" ..... 11— "	" "
" .... 21—	23	" .... 24— "	5	" .... 6—	11	" ..... 12— "	" "
" .... 22—	24	" .... 25— "	6	" .... 7—	12	" ..... 13— "	" "
" .... 23—	25	" .... 26— "	7	" .... 8—	13	" ..... 14— "	" "
" .... 24—	26	" .... 27— "	8	" .... 9—	14	" ..... 15— "	" "
" .... 25—	27	" .... 28— "	9	" .... 10—	15	" ..... 16— "	" "
" .... 26—	28	" .... 29— "	10	" .... 11—	16	" ..... 17— "	" "
" .... 27—	29	" .... 30— "	11	" .... 12—	17	" ..... 18— "	" "
" .... 28—	30	" .... 31— "	12	" .... 13—	18	" ..... 19— "	" "
" .... 29—	31	Nov.... 1—	13	" .... 14—	19	" ..... 20— "	" "
" .... 30—Nov.	1	" .... 2—	14	" .... 15—	20	" .... 21— "	" "
" .... 31— "	2	" .... 3—	15	" .... 16—	21	" ..... 22— "	" "
Nov.... 1—	3	" .... 4—	16	" .... 17—	22	" ..... 23— "	" "
" .... 2—	4	" .... 5—	17	" .... 18—	23	" ..... 24— "	" "
" .... 3—	5	" .... 6—	18	" .... 19—	24	" ..... 25— "	" "
" .... 4—	6	" .... 7—	19	" .... 20—	25	" ..... 26— "	" "
" .... 5—	7	" .... 8—	20	" .... 21—	26	" ..... 27— "	" "
" .... 6—	8	" .... 9—	21	" .... 22—	27	" .... 28— "	" "
" .... 7—	9	" .... 10—	22	" .... 23—	28	" ..... 29— "	" "
" .... 8—	10	" .... 11—	23	" .... 24—	29	" ..... 30— "	" "
" .... 9—	11	" .... 12—	24	" .... 25—	30	Dec..... 1— "	" "
" .... 10—	12	" .... 13—	25	" .... 26—Dec.	1	" ..... 2— "	" "
" .... 11—	13	" .... 14—	26	" .... 27— "	2	" ..... 3— "	" "
" .... 12—	14	" .... 15—	27	" .... 28— "	3	" ..... 4— "	" "
" .... 13—	15	" .... 16—	28	" .... 29— "	4	" ..... 5— "	" "
" .... 14—	16	" .... 17—	29	" .... 30— "	5	" ..... 6— "	" "
" .... 15—	17	" .... 18—	30	Dec. .. 1—	6	" ..... 7— "	" "
" .... 16—	18	" .... 19—Dec.	1	" .... 2—	7	" ..... 8— "	" "
" .... 17—	19	" .... 20— "	2	" .... 3—	8	" ..... 9— "	" "
" .... 18—	20	" .... 21— "	3	" .... 4—	9	" ..... 10— "	" "
" .... 19—	21	" .... 22— "	4	" .... 5—	10	" ..... 11— "	" "
" .... 20—	22	" .... 23— "	5	" .... 6—	11	" ..... 12— "	" "
" .... 21—	23	" .... 24— "	6	" .... 7—	12	" ..... 13— "	" "
" .... 22—	24	" .... 25— "	7	" .... 8—	13	" ..... 14— "	" "
" .... 23—	25	" .... 26— "	8	" .... 9—	14	" ..... 15— "	" "

MONTHLIES.		Period of Probable Conception.		Probable Barren Period.		Period of Probable Conception.	
B.	E.	B.	E.	B.	E.	B.	E.
Nov.... 24—	26	Nov.... 27—Dec.	9	Dec.... 10—	15	Dec..... 16—at	next monthly.
" .... 25—	27	" .... 28— "	10	" .... 11—	16	" ..... 17— "	" "
" .... 26—	28	" .... 29— "	11	" .... 12—	17	" ..... 18— "	" "
" .... 27—	29	" .... 30— "	12	" .... 13—	18	" ..... 19— "	" "
" .... 28—	30	Dec.... 1—	13	" .... 14—	19	" ..... 20— "	" "
" .... 29—Dec.	1	" .... 2—	14	" .... 15—	20	" ..... 21— "	" "
" .... 30— "	2	" .... 3—	15	" .... 16—	21	" ..... 22— "	" "
Dec.... 1—	3	" .... 4—	16	" .... 17—	22	" ..... 23— "	" "
" .... 2—	4	" .... 5—	17	" .... 18—	23	" ..... 24— "	" "
" .... 3—	5	" .... 6—	18	" .... 19—	24	" ..... 25— "	" "
" .... 4—	6	" .... 7—	19	" .... 20—	25	" ..... 26— "	" "
" .... 5—	7	" .... 8—	20	" .... 21—	26	" ..... 27— "	" "
" .... 6—	8	" .... 9—	21	" .... 22—	27	" ..... 28— "	" "
" .... 7—	9	" .... 10—	22	" .... 23—	28	" ..... 29— "	" "
" .... 8—	10	" .... 11—	23	" .... 24—	29	" ..... 30— "	" "
" .... 9—	11	" .... 12—	24	" .... 25—	30	" ..... 31— "	" "
" .... 10—	12	" .... 13—	25	" .... 26—	31	Jan..... 1— "	" "
" .... 11—	13	" .... 14—	26	" .... 27—Jan.	1	" ..... 2— "	" "
" .... 12—	14	" .... 15—	27	" .... 28— "	2	" ..... 3— "	" "
" .... 13—	15	" .... 16—	28	" .... 29— "	3	" ..... 4— "	" "
" .... 14—	16	" .... 17—	29	" .... 30— "	4	" ..... 5— "	" "
" .... 15—	17	" .... 18—	30	" .... 31— "	5	" ..... 6— "	" "
" .... 16—	18	" .... 19—	31	Jan.... 1—	6	" ..... 7— "	" "
" .... 17—	19	" .... 20—Jan.	1	" .... 2—	7	" ..... 8— "	" "
" .... 18—	20	" .... 21— "	2	" .... 3—	8	" ..... 9— "	" "
" .... 19—	21	" .... 22— "	3	" .... 4—	9	" ..... 10— "	" "
" .... 20—	22	" .... 23— "	4	" .... 5—	10	" ..... 11— "	" "
" .... 21—	23	" .... 24— "	5	" .... 6—	11	" ..... 12— "	" "
" .... 22—	24	" .... 25— "	6	" .... 7—	12	" ..... 13— "	" "
" .... 23—	25	" .... 26— "	7	" .... 8—	13	" ..... 14— "	" "
" .... 24—	26	" .... 27— "	8	" .... 9—	14	" ..... 15— "	" "
" .... 25—	27	" .... 28— "	9	" .... 10—	15	" ..... 16— "	" "
" .... 26—	28	" .... 29— "	10	" .... 11—	16	" ..... 17— "	" "
" .... 27—	29	" .... 30— "	11	" .... 12—	17	" ..... 18— "	" "
" .... 28—	30	" .... 31— "	12	" .... 13—	18	" ..... 19— "	" "
" .... 29—	31	Jan.... 1—	13	" .... 14—	19	" ..... 20— "	" "
" .... 30—Jan.	1	" .... 2—	14	" .... 15—	20	" ..... 21— "	" "
" .... 31— "	2	" .... 3—	15	" .... 16—	21	" ..... 22— "	" "

PERIOD OF GESTATION.

Length of Period.—This interesting and anxious period in a young wife's life is usually reckoned at 280 days, or 40 weeks, or 9 calendar months. Dr. Reid, in his report upon 500 cases, found the following:

23 cases in the 37th week.
48 cases in the 38th week.
81 cases in the 39th week.
131 cases in the 40th week.
112 cases in the 41st week.
63 cases in the 42d week.
28 cases in the 43d week.
8 cases in the 44th week.
6 cases in the 45th week.

Reckoning the Count.—It would be well in reckoning the "count," to begin about three days after the last monthly period, the rule being that conception is more likely soon after menstruation than at an other time.

A Pregnancy Table.—The following table, showing the probable beginning, duration and completion of pregnancy, and indicating the date on or about which the date of labor may be expected, may be found both convenient and useful. It allows three days after the usual 280 days, that is, the "count" begins three days after the last monthly or menstrual period:

THE PREGNANCY TABLE.

Last Day of Monthlies.		Labor On or About.		Last Day of Monthlies.		Labor On or About.		Last Day of Monthlies.		Labor On or About.	
Jan.	1	Oct.	11	Jan.	22	Nov.	1	Feb.	12	Nov.	22
“	2	“	12	“	23	“	2	“	13	“	23
“	3	“	13	“	24	“	3	“	14	“	24
“	4	“	14	“	25	“	4	“	15	“	25
“	5	“	15	“	26	“	5	“	16	“	26
“	6	“	16	“	27	“	6	“	17	“	27
“	7	“	17	“	28	“	7	“	18	“	28
“	8	“	18	“	29	“	8	“	19	“	29
“	9	“	19	“	30	“	9	“	20	“	30
“	10	“	20	“	31	“	10	“	21	Dec.	1
“	11	“	21	Feb.	1	“	11	“	22	“	2
“	12	“	22	“	2	“	12	“	23	“	3
“	13	“	23	“	3	“	13	“	24	“	4
“	14	“	24	“	4	“	14	“	25	“	5
“	15	“	25	“	5	“	15	“	26	“	6
“	16	“	26	“	6	“	16	“	27	“	7
“	17	“	27	“	7	“	17	“	28	“	8
“	18	“	28	“	8	“	18	Mar.	1	“	9
“	19	“	29	“	9	“	19	“	2	“	10
“	20	“	30	“	10	“	20	“	3	“	11
“	21	“	31	“	11	“	21	“	4	“	12

Last Day of Monthlies.	Labor On or About.	Last Day of Monthlies.	Labor On or About.	Last Day of Monthlies.	Labor On or About.
Mar. 5	Dec. 13	April 24	Feb. 1	June 13	Mar. 23
“ 6	“ 14	“ 25	“ 2	“ 14	“ 24
“ 7	“ 15	“ 26	“ 3	“ 15	“ 25
“ 8	“ 16	“ 27	“ 4	“ 16	“ 26
“ 9	“ 17	“ 28	“ 5	“ 17	“ 27
“ 10	“ 18	“ 29	“ 6	“ 18	“ 28
“ 11	“ 19	“ 30	“ 7	“ 19	“ 29
“ 12	“ 20	May 1	“ 8	“ 20	“ 30
“ 13	“ 21	“ 2	“ 9	“ 21	“ 31
“ 14	“ 22	“ 3	“ 10	“ 22	April 1
“ 15	“ 23	“ 4	“ 11	“ 23	“ 2
“ 16	“ 24	“ 5	“ 12	“ 24	“ 3
“ 17	“ 25	“ 6	“ 13	“ 25	“ 4
“ 18	“ 26	“ 7	“ 14	“ 26	“ 5
“ 19	“ 27	“ 8	“ 15	“ 27	“ 6
“ 20	“ 28	“ 9	“ 16	“ 28	“ 7
“ 21	“ 29	“ 10	“ 17	“ 29	“ 8
“ 22	“ 30	“ 11	“ 18	“ 30	“ 9
“ 23	“ 31	“ 12	“ 19	July 1	“ 10
“ 24	Jan. 1	“ 13	“ 20	“ 2	“ 11
“ 25	“ 2	“ 14	“ 21	“ 3	“ 12
“ 26	“ 3	“ 15	“ 22	“ 4	“ 13
“ 27	“ 4	“ 16	“ 23	“ 5	“ 14
“ 28	“ 5	“ 17	“ 24	“ 6	“ 15
“ 29	“ 6	“ 18	“ 25	“ 7	“ 16
“ 30	“ 7	“ 19	“ 26	“ 8	“ 17
“ 31	“ 8	“ 20	“ 27	“ 9	“ 18
April 1	“ 9	“ 21	“ 28	“ 10	“ 19
“ 2	“ 10	“ 22	Mar. 1	“ 11	“ 20
“ 3	“ 11	“ 23	“ 2	“ 12	“ 21
“ 4	“ 12	“ 24	“ 3	“ 13	“ 22
“ 5	“ 13	“ 25	“ 4	“ 14	“ 23
“ 6	“ 14	“ 26	“ 5	“ 15	“ 24
“ 7	“ 15	“ 27	“ 6	“ 16	“ 25
“ 8	“ 16	“ 28	“ 7	“ 17	“ 26
“ 9	“ 17	“ 29	“ 8	“ 18	“ 27
“ 10	“ 18	“ 30	“ 9	“ 19	“ 28
“ 11	“ 19	“ 31	“ 10	“ 20	“ 29
“ 12	“ 20	June 1	“ 11	“ 21	“ 30
“ 13	“ 21	“ 2	“ 12	“ 22	May 1
“ 14	“ 22	“ 3	“ 13	“ 23	“ 2
“ 15	“ 23	“ 4	“ 14	“ 24	“ 3
“ 16	“ 24	“ 5	“ 15	“ 25	“ 4
“ 17	“ 25	“ 6	“ 16	“ 26	“ 5
“ 18	“ 26	“ 7	“ 17	“ 27	“ 6
“ 19	“ 27	“ 8	“ 18	“ 28	“ 7
“ 20	“ 28	“ 9	“ 19	“ 29	“ 8
“ 21	“ 29	“ 10	“ 20	“ 30	“ 9
“ 22	“ 30	“ 11	“ 21	“ 31	“ 10
“ 23	“ 31	“ 12	“ 22	Aug. 1	“ 11

Last Day of Monthlies.	Labor On or About.	Last Day of Monthlies.	Labor On or About.	Last Day of Monthlies.	Labor On or About.
Aug. 2	May 12	Sept. 21	July 1	Nov. 10	Aug. 20
“ 3	“ 13	“ 22	“ 2	“ 11	“ 21
“ 4	“ 14	“ 23	“ 3	“ 12	“ 22
“ 5	“ 15	“ 24	“ 4	“ 13	“ 23
“ 6	“ 16	“ 25	“ 5	“ 14	“ 24
“ 7	“ 17	“ 26	“ 6	“ 15	“ 25
“ 8	“ 18	“ 27	“ 7	“ 16	“ 26
“ 9	“ 19	“ 28	“ 8	“ 17	“ 27
“ 10	“ 20	“ 29	“ 9	“ 18	“ 28
“ 11	“ 21	“ 30	“ 10	“ 19	“ 29
“ 12	“ 22	Oct. 1	“ 11	“ 20	“ 30
“ 13	“ 23	“ 2	“ 12	“ 21	“ 31
“ 14	“ 24	“ 3	“ 13	“ 22	Sept. 1
“ 15	“ 25	“ 4	“ 14	“ 23	“ 2
“ 16	“ 26	“ 5	“ 15	“ 24	“ 3
“ 17	“ 27	“ 6	“ 16	“ 25	“ 4
“ 18	“ 28	“ 7	“ 17	“ 26	“ 5
“ 19	“ 29	“ 8	“ 18	“ 27	“ 6
“ 20	“ 30	“ 9	“ 19	“ 28	“ 7
“ 21	“ 31	“ 10	“ 20	“ 29	“ 8
“ 22	June 1	“ 11	“ 21	“ 30	“ 9
“ 23	“ 2	“ 12	“ 22	Dec. 1	“ 10
“ 24	“ 3	“ 13	“ 23	“ 2	“ 11
“ 25	“ 4	“ 14	“ 24	“ 3	“ 12
“ 26	“ 5	“ 15	“ 25	“ 4	“ 13
“ 27	“ 6	“ 16	“ 26	“ 5	“ 14
“ 28	“ 7	“ 17	“ 27	“ 6	“ 15
“ 29	“ 8	“ 18	“ 28	“ 7	“ 16
“ 30	“ 9	“ 19	“ 29	“ 8	“ 17
“ 31	“ 10	“ 20	“ 30	“ 9	“ 18
Sept. 1	“ 11	“ 21	“ 31	“ 10	“ 19
“ 2	“ 12	“ 22	Aug. 1	“ 11	“ 20
“ 3	“ 13	“ 23	“ 2	“ 12	“ 21
“ 4	“ 14	“ 24	“ 3	“ 13	“ 22
“ 5	“ 15	“ 25	“ 4	“ 14	“ 23
“ 6	“ 16	“ 26	“ 5	“ 15	“ 24
“ 7	“ 17	“ 27	“ 6	“ 16	“ 25
“ 8	“ 18	“ 28	“ 7	“ 17	“ 26
“ 9	“ 19	“ 29	“ 8	“ 18	“ 27
“ 10	“ 20	“ 30	“ 9	“ 19	“ 28
“ 11	“ 21	“ 31	“ 10	“ 20	“ 29
“ 12	“ 22	Nov. 1	“ 11	“ 21	“ 30
“ 13	“ 23	“ 2	“ 12	“ 22	Oct. 1
“ 14	“ 24	“ 3	“ 13	“ 23	“ 2
“ 15	“ 25	“ 4	“ 14	“ 24	“ 3
“ 16	“ 26	“ 5	“ 15	“ 25	“ 4
“ 17	“ 27	“ 6	“ 16	“ 26	“ 5
“ 18	“ 28	“ 7	“ 17	“ 27	“ 6
“ 19	“ 29	“ 8	“ 18	“ 28	“ 7
“ 20	“ 30	“ 9	“ 19	“ 29	“ 8
				“ 30	“ 9
				“ 31	“ 10

WHITENING THE TEETH WITH THE STEM OF AN ALTHEA BLOSSOM.

SELF-CARE FOR WOMEN.

WITH SIMPLE HOME REMEDIES

In the days of our grandmothers, even of our mothers, ladies concocted their own lotions and creams, and cosmetics and beautifiers, and they went no further than their own gardens, fields or households for the ingredients. It is not saying too much that they were even handsomer and younger looking than our modern dames, who forget that nature is the prince of chemists, and has strewn at the very doors of cottage and castle alike all the prime essentials of health and beauty. It requires but little knowledge to know them, and but little ingenuity to turn them to refreshing and beautifying account.

To Whiten the Teeth.—The stem of the althea blossom has wonderful efficacy in whitening the teeth. Take the stem and crush the end of it, using the balance as a handle; rub the teeth vigorously with the crushed and juicy part, as if cleansing them with a brush; the result will be a brilliancy that cannot be obtained with powder, and there can be no danger to the enamel. The althea plant is common to both the Northern and Southern States.

Salt is an excellent substitute for a tooth powder. It hardens the gums and makes the teeth shine.

Lemon as a Beautifier.—As an efficacious accessory of beauty the lemon ranks high. For a face wash dilute the juice of the lemon in water. For the neck and shoulders cut the lemon in half and rub with the juicy part, letting the juice remain on the skin for a few minutes, then washing it off with soap and water.

For a face wash that will keep, strain the juice of one or two lemons, according to their size and juiciness, and mix with half a pint of distilled water. A little rosewater may be added as a perfume. Place it in a bottle and cork it tight. Rub the mixture on the face three or four times a day, letting it dry on each time.

Grapevine Lotion.—As a lotion for the eyes, tending to make them lustrous, and also as a skin cosmetic, Spanish ladies set great store by the sap of the grapevine. When the vine is in bloom, or before the grapes are ripe, an incision is made in the vine, into which a small tube or trough is inserted. A bottle is appended to the tube to catch the flowing sap. Use of this sap as an ointment for the eyes imparts to them a glow of beauty, and also gives life to the skin.

Eggshell Powder.—Spanish senoritas use a very effective skin cosmetic, which they prepare themselves, in the form of eggshell powder.

They take a basket full of shells, wash them thoroughly until all traces of albumen are removed, and crush them to a powder in a mortar or with a rolling-pin. This powder is then sifted, and is again subjected to the same crushing process until it becomes very fine. It is again sifted, and the now thoroughly pulverized part is mixed with a little cologne water. When the mass is entirely dry, it is again sifted, the result being a soft, fine, creamy-colored powder, whose application to the skin tends greatly to beautify it.

Milk as a Cosmetic.—Milk is a tonic, emollient and natural beautifier. A massage, or rubbing, of the face with cream from the morning's milk is better than with the best manufactured cold cream that ever was made, being careful to rub gently and in the direction of the wrinkles. The best method of application is to rub on as much cream as the face will stand for about a quarter of an hour, then to powder with a fine starch, to which a small quantity of alum, say one teaspoonful of alum to a pound of starch, has been added.

If not an expert at massage, just bathe the face and neck in pure, sweet milk, not over a day old, always letting the milk dry on. It may be allowed to remain on the neck and shoulders for an hour, particularly if sour milk has been used, as it can be, instead of sweet. This is said by those who have tried it to be an effective whitener of the skin.

Buttermilk, as a skin whitener, is very effective. Place it in a pan and wash, or bathe, your hands in it slowly for as long a time as you can spare. Or, mix enough bran with the buttermilk to make a thick paste; rub it freely on your hands at night, and encase them in loose gloves on retiring.

Strawberry Lotion.—Many have read of "Strawberry Mousse" as a skin beautifier. That is a big title, and ought to mean much. But, after all, it is a mere simple within reach of all. Take fresh, ripe strawberries; hull them and wash them carefully; mash them to a pulp, so that all the juice becomes free; strain through a linen cloth; dilute the strained juice with an equal quantity of water; soften it by adding a pinch or two of powdered borax. You now have what those who have used it say is a very effective lotion for whitening the skin.

Another strawberry lotion, said to possess great virtue as a skin whitener and beautifier, is made thus: Strawberries, four pounds; rectified spirits, one quart; boil together in a strong solution of salt water until nearly dry; that is, until the residuum becomes a paste. The application of this paste to arms or neck is both a whitener and astringent.

Roman ladies used crushed strawberries mixed with milk as a skin beautifier. French ladies simply crush them in clear water.

Orange Flowers for Wrinkles.—A favorite remedy for wrinkles, especially in the South, is steeped orange flowers. A large cloth is spread

PURE MILK SOFTENS AND IMPROVES THE COMPLEXION.

under an orange tree, and the blossoms which speedily cover it are gathered up, steeped in water for an hour, and then strained through a muslin strainer. After a second straining the water is bottled. A little of this water rubbed at reasonable intervals on the face is wonderfully efficacious in smoothing away wrinkles, and small quantities of it taken inwardly have a soothing effect upon the nerves. As a summer drink nothing proves more restful than a glass of ice-water in which a couple of dessertspoonfuls of orange-flower water has been mixed.

Carnation Tonic.—Carnations, used in a crushed form, or in form of a steep, have had a long established popularity as a face tonic. Their use imparts to the skin a healthful tone, and so stimulates the facial muscles as to keep the face rotund and cheerful.

Rose Leaf Rouge.—The full effect of a rouge upon the face may be obtained by crushing rose leaves in the hands and then rubbing them upon the cheeks, so as to get the full effects of the juice. Some ladies first macerate the rose leaves in white-wine vinegar and then apply them.

The Salt Bath.—Says one lady, who is proud of her beauty and knows how to preserve it: "Give me a bag of salt and plenty of cold water, and I can do without any other ingredients." When she bathes, she dissolves a goodly quantity of salt in the water, and when she emerges, she declares she "feels like an empress."

The Watermelon Rub.—Simple as it may seem, there is wonderful efficacy in the watermelon as a skin beautifier. Take a piece of it, with plenty of the red part attached, and give the face and neck and arms a good rubbing. Rub until you have exhausted the pulp of the melon quite up to the rind. This is said to be excellent also for the removal of wrinkles. Like results may be obtained by straining off the juice of the melon, and making applications of it to the face, neck and shoulders.

Tomato Bleach.—Exhuberant and kind nature provides many remedies for skin defects and of the plainest everyday kind. Though known before, word comes from Paris that there the tomato is regarded as an invaluable cosmetic. In applying it, cut it into thin slices; rub well upon hands, neck or shoulders; let it remain for the space of five minutes; wash the parts off with water mixed with borax, using a teaspoonful of powdered borax to a quart of water. The application bleaches out sunburn and makes a yellow neck white.

Spinach Lotion.—Spinach has excellent properties as a skin whitener and beautifier. Wash it thoroughly; boil two heaping handfuls of it in two quarts of water; filter well and add:

Powdered alum Pulverized camphor Powdered borax	15 grains each.

Use twice a day, always shaking the bottle well.

Cucumber Lotion.—Every lady knows the value of the cucumber as an ingredient in the preparation of creams and lotions for the complexion. It is the natural arsenic in the cucumber that does the business. So effective is the cucumber found that many use it in the raw state, merely slicing it and rubbing the skin briskly with the sliced parts. But a better way is to cut the cucumbers into small pieces, pound them into a paste, then extract the juice by straining through a jelly-bag. Apply to the skin twice or three times a day.

Potatoe Hair Dye.—A harmless hair dye may be extracted from potatoes. Pare a dozen potatoes; cover them with cold water and let them boil in an iron pot till soft. Strain the water off and leave it to cool, being careful that it touches nothing, lest it stain. Make a thorough application of it to the hair, and then, in order to set the color, let the hair dry in the sun.

Vinegar Bandage for Double Chin.—A vinegar bandage is efficacious in facial neuralgia and headachy conditions. It is also a remedy, if its use is persisted in, for double chin. This undesirable appurtenance and, at times, beauty destroyer, can be reduced by dipping a piece of linen in pure vinegar, rinsing it out thoroughly, placing it under the chin, letting it extend well up under the ears, and wrapping over it and up around the head a longer bandage, so as to keep it in place. Leave it on for two hours at a time. Should the application be followed by redness, or signs of inflammation, apply starch, or other soothing powder.

For Coarse Skin.—Sometimes the skin seems coarse and the pores too large and open. A good remedy for this condition is the following:

Ground barley	3 ounces
Honey	1 ounce
White of an egg	1 ounce

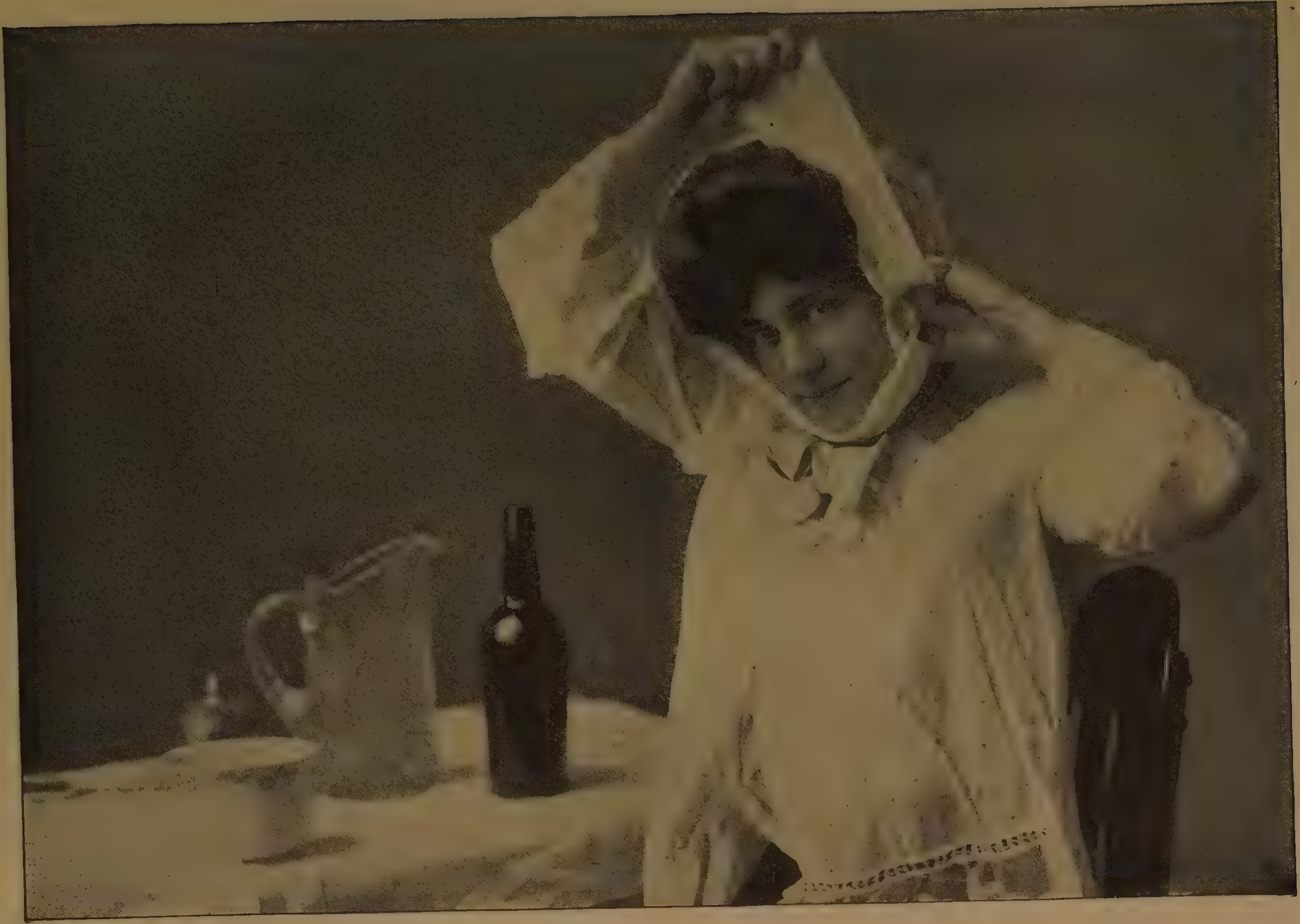
Mix well and spread it at night over the face, using a cheese cloth protector or a mask. Wash the face in the morning with lukewarm water.

For Tan and Sunburn.—Make a mask and spread it with equal parts of linseed meal and rye flour. Put the mask on at night when going to bed. Wash the face next morning with lukewarm water.

Egg Shampoo.—Mix the white and yellow of an egg thoroughly in about an ounce of water. With this massage the scalp vigorously, using rotary motion of the hand. After the operation rinse the hair thoroughly with water.

Hair Lotions—When the hair is light, and it is desirable to keep it so, an excellent lotion is made of equal parts of rhubarb stalks and honey steeped in three parts of white wine. After steeping for 36 hours, strain it and thoroughly wash the hair with it, letting it dry on.

One of the old-fashioned hair lotions is made of equal parts of green



A VINEGAR BANDAGE IS EXCELLENT TO REDUCE A DOUBLE CHIN.

tea and garden sage, say about two ounces of each; cover with three quarts of boiling water and let boil till reduced to about one-third of the original quantity; remove it from the fire and let it stand for 24 hours; then strain, bottle, and use it night and morning, rubbing it thoroughly into the scalp.

Celebrated Wrinkle Eradicator.—In your house you have, of course, such things as sweet almonds, cloves and nutmegs. Now go to the drug store and get some powdered benzoin, incense and gum arabic, 32 grains of each. Dissolve these in eight ounces of alcohol. When this is done thoroughly, add as follows:

Powdered sweet almonds	46 grains
Powdered cloves	16 grains
Ground nutmeg	16 grains

Mix all thoroughly and let stand for 48 hours, shaking it now and then. Add half an ounce of rose water, and strain the whole through a coarse rag. Apply to the wrinkled parts every night before retiring. The winkles will disappear.

Oat and Almond Meal Wash.—For whitening the hands, wash them frequently in water made soft by introducing a little oat or almond meal. Then rub them with a mixture made as follows:

Glycerine	1 part
Rose water	1 part
Lemon juice	1 part

For Forehead Wrinkles.—Mix equal parts of alcohol and the white of an egg; spread upon the forehead night after night, binding the forehead with a bandage or gentle compress. Continue the application till the wrinkles disappear.

Skin Lotion.—The following is an excellent lotion for stimulating and toning the skin:

Powdered long peppers	¼ of an ounce
Powdered cinnamon	½ ounce
Aromatic spices	1½ ounces
Cardamom seeds	⅜ of an ounce
Alcohol	1 quart

Mix thoroughly and apply it to the skin as a wash, at least once a day.

To Produce Ruddy Cheeks.—Never resort to rouge if you can possibly help it. Try everything else first. Here is something which imparts a pink glow to the cheeks without injury to the skin:

Vinegar	2 pints
Isinglass	3 ounces
Nutmeg	2 ounces
Honey	6 ounces

Add a pinch of red sandalwood, and place the whole over a slow fire for half an hour, not boiling it but thoroughly heating it. Strain it and let it cool. Before using it, remove all dust and grease from the face by washing. Then apply it to the cheeks and face, rubbing in freely. The result will be a pink hue, far preferable to that produced by rouge.

Salt in the Toilet.—As a toilet article salt is indispensable. Rubbed into the hair and then brushed out carefully it proves not only a scalp cleanser but a splendid hair tonic.

To clear the vision and tone the eyelids, bathe the eyes in warm salt water, opening and shutting the eyes in the water.

Before starting on a long walk bathe the feet in strong salt water. They will stand the friction of the shoe better, be less susceptible to heat or cold, and will become less tired.

Parsley Lotion.—An efficacious skin lotion is made of a heaping handful of parsley placed in a quart of boiling water. Allow it to steep for a time, then filter and place in it fifteen grains each of powdered alum, powdered borax and pulverized camphor. Use it twice a day, shaking the bottle well before using.

Carrot and Beet Root Powder.—These can be used separately or together as a complexion powder. Slice and scrape six raw carrots. Do the same with half a pink beet root. Squeeze the juice from them through a muslin bag. Mix this with three ounces of finely powdered corn starch. Expose to the sun, stirring occasionally until all the liquid is evaporated. You have a lovely tinted powder, which, when sifted and used, imparts a glow and color to the skin.

Beet Root Rouge.—Take the juice of half a dozen red-beet roots and dilute with rose water till it is the shade you want. An application to the cheeks and face will prove a good substitute for rouge.

Damask rose petals macerated in pure white vinegar also make a harmless but effective rouge, in much favor with Turkish ladies.

Eyebrow Culture.—If your eyebrows are too thin, wash them frequently and thoroughly in lukewarm water, then rub with olive oil. If they are inclined to scatter, apply a little castor oil, and brush them frequently in the right direction with a hard toothbrush.

Treatment of the Feet.—The following is an excellent formulæ for an aromatic foot-bath:

Dried mint leaves	2 pounds
Sage leaves	1 pound
Angelica	3 ounces
Juniper berries	1 ounce
Rosemary leaves	1 ounce

Bathe the feet for half an hour before going to bed.

Rubbing the soles of the feet with lemon will soften them and drive

RUBBING THE SCALP WITH SALT INVIGORATES THE HAIR.

away the callous flesh. Crushed elder leaves under the feet are most efficacious in driving away fatigue.

Honey Balsam.—The following formula is an excellent preparation for tan and sunburn:

Pure honey	4 ounces
Glycerine	1 ounce
Rectified spirits	1 ounce
Citric acid (pure)	3 drams
Essence of ambergris	6 drops

Mix the first two by gentle heat; add the acid to the spirits; when the first two are nearly cold, add the next two, and lastly the ambergris. Apply to affected parts by gently rubbing two to three times a day.

Skin Foods.—These are comparatively modern preparations for toning and freshening the skin, removing wrinkles and preserving the complexion. They are generally applied once or twice a week to hands, face, arms and neck, by the massage process; that is, by rubbing and skin manipulation till the application is thoroughly absorbed. Then the parts should be wiped off carefully with a soft piece of old, dry linen, or silk handkerchief. As a preparatory step to the application, and one calculated to make it more effective, a towel dipped in steaming water should be spread over the face and allowed to remain for a minute or two; follow this with a towel dipped in cold water, allowing it to remain for the same length of time. A standard formula for such a skin food is as follows:

Almond oil	2 ounces
Spermaciti	½ ounce
White wax	½ ounce
Lanoline	1 ounce
Rose water	2 ounces
Tincture benzoin	2 drams

Another and somewhat simpler preparation for the same purpose and applied in the same way is:

Lanoline	1 ounce
Almond oil	½ ounce
Rose water	40 drops
Tincture of benzoin	10 drops

A third formula, and one as effective as any, is the following:

Orange flower water	4 ounces
Almond oil	4 ounces
Spermaciti	1 ounce
White wax	1 ounce

Toilet Water.—A very simple and pleasant toilet water is composed of:

Eau de Cologne	2 ounces
Distilled water	3 ounces

Blackheads.—Many complexions are spoiled by the frequency of blackheads in the skin. To soften them so that they may be easily squeezed out by the fingers or the application of a watchkey, use the following:

Boracic acid	1 dram
Alcohol	1 ounce
Rose water	2 ounces

Or,

Green castile soap	2 ounces
Witchhazel	2 ounces

The Elder Leaf Bandage.—Gather elder leaves, together with the flower if possible; steep a handful of them in one or two quarts of boiling water. If, on awakening with heavy eyes, or suffering with a headachy feeling, or troubled with a sense of ennui, lie down for an hour, first laying the steeped leaves, after they are cool, across the forehead and eyes, binding them in place with a soft cloth. The effect is wonderfully sedative, as well as clarifying to the mind.

Standard Toilet Powder.—A good standard toilet powder for safe everyday use, or for occasions when such is required, is composed as follows:

Talcum	10 drams
Wheat starch	1 dram
Orris root (pulverized)	1 dram
Oil rose geranium	2 drops
Oil of Bergamot	1 drop

Grandmother's Beauty Bath.—Ye olden dames bathed luxuriously. Here is one of their favorites:

Barley	2 pounds
Oatmeal	2 pounds
Fine bran	2 pounds
Rice	2 pounds
Bi-Carbonate of Soda	8 ounces
Borax	8 ounces
Dried lavender flowers	1 pound
Bay leaves	1 pound

Boil them for one hour in a sufficient quantity of rain water, and after straining carefully mix two quarts with the bath water.

OBTAIN A SMOOTH BROW AND CLEAR EYES BY USING A BANDAGE OF ELDER LEAVES.

WOMEN'S SELF-CARE

IN INTERNAL AILMENTS.

Careful as women may be of their complexions, and efficacious as they may find the simple home remedies prescribed, it is well to know that beauty, facial and otherwise, is always coupled, more or less, with the condition of their internal organs. Hence the necessity for keeping them in functional repair, so that the secretions may always find right direction, and pain may not mar the features, distort the figure, or impair cheerfulness and vivacity. The correctives of female internal disturbances given here are modern and approved in the best medical practice.

UTERINE (WOMB) TONIC AND STIMULANT.

A sense of weakness and dragginess in the womb and its regions, whatever may be its cause, is satisfactorily relieved by the Compound Elixir of Helonias, which may be had in the drug stores; or, the same may be made at home, in the form of a tincture, according to the following formula:

Partridge berry	96 grains
Unicorn root	48 grains
Blue cohosh	48 grains
Cramp bark	48 grains

Macerate (steep) these for 24 hours in a fluid pint, composed of equal parts of water and alcohol, strain, bottle, and take a teaspoonful three times a day. If the Compound Elixir is used, take in the same way.

MENSTRUAL IRREGULARITIES.

When the menstrual flow becomes irregular through physical exhaustion from any cause, and is accompanied by relaxation and weakness of the organs involved, an excellent remedy is provided in uterine pills made after the following formula:

Viburnum opulus (cramp bark)	40 grains
Caulopophyllin (blue cohosh)	10 grains
Extract michella repens (squaw vine)	40 grains
Extract phytollacca (pokeberry)	20 grains
Strychnia sulphate (strychnine)	1 grain

Make into forty (40) pills and take one pill three times a day until relieved.

MENORRHAGIA (PROFUSE MENSTRUATION) AND LEUCORRHEA (WHITES).

In cases of profuse menstruation (menorrhagia) and whites (leucorrhea), and in all catarrhal conditions of the female generative mucous membrane, an excellent uterine tonic can be made from:

Praximus Americana (white ash bark)	128 grains
Viburnum prunifolium (black haw)	128 grains
Viburnum opulus (cramp bark)	128 grains
Aletris farinosa (unicorn root)	64 grains
Michella repens (squaw vine)	64 grains
Caulopophyllin (blue cohosh)	64 grains

Macerate (steep) these for 24 hours or more in a fluid pint composed of equal parts of water and alcohol, strain, bottle, and take of the tincture a tablespoonful three times a day.

TONIC, UTERINE (WOMB) SEDATIVE AND ANTISPASMODIC (GOOD FOR SPASMS).

The following formula provides an excellent remedy in a large class of internal ailments whose characteristics are extreme nervousness and irritability:

Viburnum opulus (cramp bark)	480 grains
Scuttelaria (skull cap)	480 grains
Symplocarpus fœtidus (skunk (swamp) cabbage)	240 grains

Macerate (steep) in a liquid pint composed of equal parts of water and alcohol for twenty-four (24) hours, strain, bottle, and take for a dose of the tincture two teaspoonfuls three times a day.

The above combination is used with good results in hysteria, chorea, dysmenorrhea (difficult and painful menstruation), irritable womb, and also as a general nerve tonic and sedative.

OVARIAN CONGESTION AND PAINFUL MENSTRUATION.

The preparation known as **Liquor Sedans**, found ready for use in the drug stores, has proved to be very useful and effective in cases of ovarian congestion, enlargement of the womb and painful menstruation. The ingredients in each ounce of Liquor Sedans are:

Black haw	60 grains
Hydrastis (golden seal)	60 grains
Jamaica dogwood	30 grains

The dose of Liquor Sedans may vary from one-half to one teaspoonful three times a day, according to the severity of the ailment and strength of the patient.

HERPES PROGENTITALIS (ITCHING OF THE VULVA).

This annoying visitation of the external parts of the female genital organs yields best to local treatment. An effective unguent, or salve, for such treatment can be made as follows:

Boric acid	30 grains
Oxide of zinc	60 grains
Powdered starch	60 grains
Petrolatum	1 ounce

Apply on cotton to the affected part twice a day.

NEURALGIA AND DYSMENORRHEA (PAINFUL MENSTRUATION).

These painful afflictions yield readily to a prepartion composed as follows:

Fluid extract hyoscyamus (henbane)	2 drams
" " canabis Indicus (Indian hemp)	1 dram
" " cimicifuga (snake root)	4 drams
Spirits of camphor	2 drams
Compound spirits of ether	3 ounces

Mix thoroughly, and take a teaspoonful in water three times a day.

VAGINAL ASTRINGENT AND ANTISEPTIC.

A cleansing and freshening preparation for the vaginal canal is composed as follows:

Alum	1 ounce
Sulpho carbolate of zinc	2 drams
Extract of hydrastis (colorless)	12 grains
Sulphate of morphia	2 grains
Boric acid	3 ounces

Mix thoroughly. Dissolve a teaspoonful of the compound in a pint of hot water and use as an injection night and morning.

ULCERATIONS OF WOMB AND VAGINA.

Any one of the following formulas made into a uterine suppository with cocoa butter will be found effective in the numerous ulcerations of the womb and vagina. Observe that the quantities of the components are for one suppository only. Where others are required increase the equivalents proportionally:

I.

Boric acid	5 grains
Powdered alum	5 grains

For one suppository.

II.

Viburnum prunifolium (black haw)	2 grains
Hydrastis canadensis (golden seal)	2 grains

Helonias	2 grains
Viburnum opulus (cramp bark)	1 grain
Piscidia erythrina (Jamaica dogwood)	1 grain

For one suppository.

III.

Aristol	3 grains

For one suppository.

IV.

Iodoform	2 grains
Sulphate of morphia	$\frac{1}{6}$ grain

For one suppository.

V.

Sulphate of zinc	1 grain
Iodoform	1 grain

For one suppository.

VI.

Boroglyceride	10 grains
Acetanilide	3 grains

For one suppository.

VII.

Extract of hydrastis	5 grains
Borax	5 grains

For one suppository.

LEUCORRHEA (WHITES).

Valuable preparations for the cure of this very common and, at times, distressing ailment, to be used in the form of injections, are the following:

I.

Dried alum	½ ounce
Borax	2 ounces
Boric acid	4 ounces

Mix thoroughly. Dissolve a teaspoonful of the mixture in a pint of hot water, and use as an injection night and morning.

II.

Dried alum	4 drams
Borax	2 ounces
Boric acid	4 ounces
Oil of peppermint	2 drams

Mix well. Dissolve a teaspoonful of the mixture in a pint of hot water, and use as injection night and morning.

III.

Dried alum	½ ounce
Borax	2 ounces
Boric acid	4 ounces
Thymol	10 grains
Eucalyptol	10 grains
Oil of peppermint	2 drams

Mix. Dissolve a teaspoonful of the mixture in a pint of hot water and use as an injection night and morning..

For one suppository.

CARE OF THE COMPLEXION.

BY PRUDENCE BERRYMAN.

Woman's Beauty.—If a vote were to be taken among the inhabitants of the globe as to what one thing, with the exception of the moral qualities, is most to be desired in a woman, the unanimous election would be —beauty.

Far above influence, social position or money, beauty compels the first admiration and homage of all mankind. So well is this fact known that every woman has an instinctive desire to be attractive, for she realizes that her power for good and, incidentally, evil is thereby greatly increased.

Is it any wonder then that many, in their ignorance, should employ artificial means in the vain endeavor to attain this end, little realizing that it is natural for every woman to be lovely, and that she must only assist nature. Paint and powder deceive no one, and sooner or later even the user is obliged to acknowledge that their use has destroyed what remnants of good looks she originally possessed.

Aiding Nature.—Now understand I do not mean to intimate that every woman may have perfectly shaped features; that is not within her or anyone's else power. But I do say that she can aid nature so much in her work that the beauty appertaining to good health and a perfect physical condition will be hers. That should be the aim of every woman, and believe me, it is no ignoble one.

What Woman May Have.—Regularity of feature and a graceful form count little when a dull blotchy complexion is their accompaniment. On the other hand no one, not even the most hardened critic, can deny the attractions that lie in a bright, glowing skin, a well-kept hand, a perfectly developed form, and a head of hair that is a veritable crown of glory. Yet all these may be had by the woman who is willing to work for them conscientiously and patiently, for remember that Rome was not built in a day, and neither is the possession of beauty to be obtained but as the reward of unremitting labor.

The First Step.—With this idea in mind, the first step is toward remedying a bad complexion, probably the most fatal foe to an attractive face. The requisites may be summed up in a few words, pure air, pure water, a correct diet and a right proportion of rest and exercise. Very simple it sounds, does it not? Yet the whole difficulty lies in obtaining these seemingly easy conditions. In the complex life of a large city it is well nigh impossible. Therefore a woman is obliged to resort to a few harmless expedients to supply the needed deficiencies.

Pure Air and Water.—It is of these expedients that I wish particularly to speak, after a few words on the subject of hygienic living as defined above. Pure air and pure water are rare commodities in cities, but that is no reason for declining their medicinal services. Time spent in outdoor exercises is well spent and amply repays one in many different ways. Badly ventilated sleeping and sitting rooms are responsible for any number of bad complexions, and we would hear fewer complaints on this score if people more fully realized the tonic effects of fresh air taken into the lungs.

Drinking Water.—Equally difficult is it to impress people with the necessity of drinking enough water daily to thoroughly flush the whole system. Spring-water being out of the question with many people the available supply should be rendered as pure as possible by filtration and boiling.

In regard to a proper diet no one set of rules can be given that would suit everybody. Each person must study his or her individual peculiarities, and decide what foods are best eaten, and what ones excluded from the daily menu. It is safe to say, however, that much hot bread and cake, rich pastries, candy and things that are greasy are best left alone by the woman who values her looks.

Exercise.—Exercise, like diet, must be regulated by personal peculiarities. What is too much for one might not be enough for another.

A settled amount of outdoor exercise should form part of each day's program, and it is best taken at the same hour each day. Personally I prefer walking, but that is a matter of taste. Do not confuse walking for health with shopping. The former means a brisk walk, the country preferred, with a short skirt, heavy-soled boots and free swinging arms. That is the correct and only healthful way of doing it. In short, make a business of your exercise, if you only devote half an hour each day to the operation.

The same conscientiousness should be employed in the hours for rest and recreation, and if this rule is followed the results will surprise not only you but all your friends.

General Physical Condition.—All this relates to the general building up of the system. It is impossible to have a clear skin when the general physical condition is not what it should be and the vital organs are not performing their proper functions. Your first efforts must be directed toward this end, as the following suggestions will have little effect if the primary cause of the trouble is not first removed.

Neglect of Face.—The care of the face is not the light matter that many people think, and, in fact, the face seldom receives a sufficient amount of attention. How many times do we see blackheads and those dark lines and shadows on an otherwise attractive face. Its owner would probably consider herself grossly insulted if you intimated that her face was dirty, yet such is unmistakably the truth. She might tell you that she washes it several times a day and consequently it should be clean.

Insufficient Washing.—What this lady does not know, and what many other people do not know, is that the use of soap and water is not sufficient washing. The face, being the only part of the body exposed, receives a thick coating of grime and dirt from roads and streets. The application of cold water closes the little pores containing their grimy contents and makes the future task of cleansing so much more difficult. Blackheads are nothing more nor less than dirty pores, and pimples are often caused from them.

Protection of the Skin.—As far as possible the skin should be protected from undue exposure to the hot sun and dust. When returning home after such an exposure wipe the face first with a soft unstarched towel or piece of muslin. Nothing that could in any way scratch or injure the skin should ever be used. This wiping will remove some of the dirt, and a reliable cream should next be rubbed into the pores and then wiped off, to take away the rest. It is always a good plan to use a dry cloth on the face before washing, which should be done with warm water and a good soap. Be sure to rinse the face thoroughly with clear warm water after using soap, and then, but not until then, use cold to close the pores.

The following creams and lotions are recommended by eminent authorities as cleansing agents, and can be relied upon to do all that is claimed for them. Cream of Pond Lilies agrees especially well with oily skins. It has been pronounced unsurpassed, and, moreover, has the merit of keeping for any length of time.

Cream of Pond Lilies.

Orange, flower water, triple..........	6	ounces.
Deodorized alcohol	1½	"
Bitter almonds, blanched.............	1	ounce.

Cream of Pond Lilies—Continued.

White wax	1	drachm.
Spermaceti	1	"
Oil of benne	1	"
Shaving cream	1	"
Oil of bergamot	12	drops.
" cloves	6	"
" néroli, bigrade	6	"
Borax	⅕	ounce.

Dissolve the borax in the orange-flower water, slightly warmed. Mix the wax, spermaceti, oil of benne, and shaving cream in a bain-maire, at gentle heat. Then stir in the perfumed water and almonds, and finish as directed for the next lotion.

Almond Lotion.

Bitter almonds, blanched	4	ounces.
Orange-flower water	12	"
Curd soap (any fine toilet soap)	½	ounce.
Oil of bergamot	50	drops.
" cannelle	10	"
" almonds	20	"
Alcohol, 65 per cent	4	ounces.

Prepare this in the same way as the Cream of Pond Lilies.

This is a bland lotion, very cleansing, whitening and softening. The soap must be powdered or broken up and dissolved in the orange-flower water by heating in a bain-marie. Beat up the almonds in a clean marble mortar, and gradually work in the soap and water. Strain through a clean muslin strainer, then return to the mortar and, while stirring, gradually work in the alcohol in which the oils have been previously dissolved.

Cucumber Lotion.

Expressed juice of cucumbers	½	pint.
Deodorized alcohol	1½	ounces.
Oil of benne	3¼	"
Shaving cream	1	drachm.
Blanched almonds	1¾	drachms.

The preparation of this is the same as for almond lotion. It is an excellent cosmetic to use in massaging the face and throat, as it not only whitens the skin but also tones any relaxed tissues. It may also be used to cleanse the skin during the day.

Oily Skins.—Many people, especially brunettes, are troubled with an oily skin and enlarged pores. This condition is remedied by an astringent lotion, such as the following, and the application of Cream of Pond Lilies after the warm bath at night. A complexion brush is an excellent investment; one should be chosen that has fine camel's-hair bristles. It is used in connection with a good soap. A few drops of tincture of benzoin in the water with which the face is rinsed has a tonic effect upon the skin, tending to close the enlarged pores and whitening it.

Hungarian Water.—This formula for Hungarian Water is recommended by a celebrated specialist. The substances should digest in the spirit for two weeks, being agitated daily. Then filter if not clear.

Extract of orange flowers	1	pint.
“ roses (triple)	1	“
Oil of lemon	1	ounce.
“ melissa	1	“
“ peppermint	30	minims.
“ rosemary	2	ounces.
Spirits of wine (rectified)	5	quarts.

Face Steaming.—This treatment has many advocates, but, like other good things, it is often overdone, and hence produces the opposite result. There is no doubt but that it is of great aid in keeping the skin in a healthy condition, if it is used in the right way. Once a week is as often as one should use a steamer. Face steamers can be purchased in nearly any drug store, with full directions as to use. It is best to have the genuine article if possible, but if not one can be improvised in this way. Take an ordinary watering pot and remove the sprinkler; attach a piece of rubber tubing to the spout and on the other end of the tubing insert the sprinkler. Fill the pot with water and place it on a gas stove or other heating apparatus while you make your other preparations.

Use of Cleansing Creams.—Rub one of the cleansing creams well into the pores and wipe off with a clean soft cloth. Now repeat the process to remove as much of the surface dirt as possible, and you are ready for the steaming. For this the steamer should be removed from the fire, as the steam from boiling water is too hot for the face skin. Envelop the entire head and the steamer in a Turkish towel, taking care that the back of the neck is not exposed. It is rather a good plan to bandage the eyes and hair so that they are not included in the sweating process.

When the perspiration is flowing freely, emerge from the towel and carefully go over the whole face and neck with an old soft cloth or piece of flannel. You will be very much surprised to see the amount of soil that will come off. Taking the tips of the fingers rub in some good skin food, such as the following:

Lanoline Cream.

Lanoline	1 ounce.
Sweet almond oil	½ "
Boric acid	40 drops.
Tincture of benzoin	10 "

The movement should be upward and rotary. No more specific directions can be given, for that comes under the difficult head of massage, which no one but an expert can successfully attempt. To her also must be relegated the task of removing wrinkles, of rendering a thin face plump or reducing superfluous flesh. All I have endeavored to do is to show women how they may keep their bodies in such a thoroughly healthy condition that the reflection may be seen in their faces. The face is the visible seat of emotion, and to it we look for evidences of character, and form our opinions accordingly. How necessary is it then that we should make it a fit medium for revealing the hidden soul, which, after all, is the true source of all beauty.

CARE OF THE HANDS.

What the Hands Show.—Hands show the effects of time and ill-usage, almost, if not quite as much, as the face. Between the ages of sixteen and twenty years they attain their maturity and beauty of symmetrical development. If not subjected to harsh treatment, they will remain practically unchanged until thirty. After that an almost imperceptible alteration begins, and, without careful attention beauty is on the wane. The tissues become attentuated, the skin begins to grow dry and inclined to wrinkle, causing the joints and veins to show more prominently. This is due to the gradual absorption of the fat cells by the subcutaneous tissue. It is the same cause as that which promotes wrinkles in the face—the looseness of the epidermis. Neglect will hasten the aging of the hands and care will rejuvenate them. Hands which have suffered from unremitting toil and neglect, as well as utter indifference as to their welfare, will readily improve by systematic daily treatment and respond most gratefully by showing an unfamiliar smoothness, whiteness and flexibility.

Training the Hands.—The hands grow stiff and ungainly and lose their suppleness without exercise, just like any other member of the body. Sleight-of-hand tricks, the pianist's skill and all exercises which require manual dexterity are performed only through repeated daily practice. Much of the individual dexterity of the fingers is lost in performing heavy household tasks.

Exercise for the Muscles.—A good exercise for promoting flexibility of the muscles of the hand is to double it up into a fist, then open it suddenly; stretching the fingers wide apart. Repeat these exercises twenty-five times with each hand several times a day, if the joints seem to be losing their suppleness.

The Five-Finger Exercise.—Five-finger exercises, the same as performed upon a piano, using instead a hardwood table as a key-board, give independent action to the finger muscles, and are useful when the fingers begin to grow stiff from age or other causes. Anointing the hands with pure olive or sweet almond oil is a beneficial preliminary to the exercise.

Anointing the Hands.—Another way to make rough and stiff hands supple is to anoint them thoroughly with oil and work it well into every joint. Wash it off with warm water and pure, bland soap. Dry carefully and apply the following lotion: Best glycerine, witch-hazel extract and distilled or boiled water, equal parts. Now, place one hand upon the back of the other and grasp firmly. Slowly pull the under hand out. Repeat a dozen times with each hand. If persevered in, daily, this treatment will render the hands flexible, soft and shapely.

To Wash the Hands Properly.—Imperfect washing and incomplete drying of the hands, especially in cold weather, renders them rough, red and liable to chap. To hastily and frequently dabble the hands in hard water of varying temperature, to neglect to rinse off the soap and to carelessly dry them on a rough, unabsorbent towel, is to invite a most unbeautiful condition of the hands.

Wearing Gloves.—When engaged in sweeping and dusting and similar household tasks, the hands should be protected with loose gloves. If rubber gloves are not used in dishwashing, a dishmop should be used, to prevent the hands from being so frequently immersed in hot, soapy water.

Washing of the Hands.—After doing rough, coarse work which has begrimed the hands, before attempting to wash them, rub in the pores a little vaseline or oil to loosen the dirt. Then wash them in hot water and pure soap, using a hand-scrubbing brush. Lather them well and remove every particle of grime from about the nails. Turn out the soapy water and rinse them in tepid water and, lastly, in cold, so that they will not be made too tender. A bit of borax added to the rinse water—just enough to make it feel slippery—aids in softening and whitening the hands. Hard water is very harsh and drying to the skin of face or hands, and boiled, distilled or soft rain water should be used when obtainable.

Drying the Hands.—After thoroughly rinsing the hands, dry them carefully upon a soft towel. Press the finger tips separately between the folds of the towel to give them a tapering shape.

To Prevent Chapping.—As a further precaution against chapping in cold weather a little almond meal, or fine corn or oat meal may be dusted over them. Some hands are so delicate in winter that the use of even a mild soap is attended with harshness and cracking of the skin. In such cases the water may be softened with a bit of borax and the almond meal rubbed upon them while wet, rubbing it off as they are dried upon a towel.

Removal of Stains.—Before washing the hands, all stains should be removed by a mild acid, such as lemon juice, a slice of raw tomato, diluted vinegar or oxalic acid. If strong acid is used to remove obstinate stains, a little cold cream should be rubbed in afterwards.

Whitening the Hands.—It is claimed that the hands may be quickly whitened by rubbing them well for three nights in succession with sweet almond oil and then dusting over them as much fine chalk as they will retain. The secret of soft white hands is not idleness, nor complete immunity from household tasks, but thorough washing, frequent oily inunctions and careful drying.

Red Hands.—Anything which impedes the free circulation of the blood, such as tight lacing, tight sleeves, or belt, too small gloves, etc., will produce, in some people, redness of the hands or nose. The blood is prevented from returning freely from the extremities. If there is no existing construction of any part then there is a naturally deficient bodily circulation, which should be corrected by exercise, or body massage, which is but exercise by proxy. Hold up the hands as much as possible so that the veins may become depleted. Hands which are continually allowed to hang down will always present a swollen condition of the blood-vessels.

A Whitening Lotion.—An excellent bed-time lotion is made of the following simple and harmless ingredients:

Honey	1 ounce.
Lemon juice	1 ounce.
Eau de Cologne	1 ounce.

It can also be used to rub on the hands after rinsing, just before drying them.

Wash for Rough Hands.—The following wash will smooth and whiten rough hands:

Lemon juice	3 ounces.
White wine vinegar	3 ounces.
White brandy	½ pint.

Remedy for Chapped Hands.—A whitening and healing remedy for chapped hands is camphor ice, which is made as follows: Place one-half pound of sweet almond oil in a bain-marie or earthenware dish, set in a vessel of boiling water. Add one-half ounce of white wax and one-half ounce of spermaceti. Dissolve in the heated oil one ounce of gum camphor. Stir with a wooden implement until the lump camphor is entirely dissolved. Then pour in slowly, stirring all the time, one-half pint of best rose water. After it has cooled somewhat, pour into small china jars.

Remedy for Moist Hands.—For moist or perspiring hands a little starch, scented with any favorite perfume, may be dusted over them occasionally, as it is very drying. Washing them in water in which a lump of soda is dissolved is also helpful, as the soda neutralizes the acid of the perspiration. Another remedy for undue moisture of the palms consists of Cologne water, seventy grams; tincture of belladonna, fifteen grams. A gram is the unit of French measurement and equals about fifteen and one-third grains, troy weight. Clammy hands that do not exactly perspire may be benefited by washing them in tepid water in which a few grains of alum have been dissolved.

CARE OF THE NAILS.

Manicure Outfit.—Every woman willing to take the trouble can become her own manicure. Her implements need be but four—a pair of curved scissors, a nail file, a chamois nail polisher and an orange-wood stick.

To Cut Without Splitting.—To soften the nails so that they may be filed or cut without splitting, immerse the finger tips in a small bowl of warm, soapy water for about ten minutes. Dry them by gentle pressure and cut the nails in an oval curve, leaving them just long enough to protect the end of the finger.

Treating the Nails.—Do not cut the selvedge about the base of the nail, but dip the pointed orange-wood stick in lemon juice and push the cuticle gently back until the lunula, or half-moon, shows white and even. The moons are indications of physical strength, and are not usually found upon the nails of the sick or enfeebled. Remove all deposit from beneath the nail with the orange-wood stick. Do not use a sharp instrument to scrape the nail either beneath or upon its surface.

Polishing the Nails.—Apply a little cold-cream to the surface of the nails and cover them with a polishing powder. Rub them briskly across their surface until they feel warm from the friction. Then put on the finishing touch by rubbing each nail with the palm of the other hand. This process consumes but a very little time once a week, and a light rubbing with the chamois polisher each day will keep the nails in dainty and attractive condition.

If the nails be hard or brittle, immerse them in warm olive oil every night or rub a little vaseline upon them.

Formula for Nail Powder.

Violet talcum powder..................	½ ounce.
Pulverized boric acid..................	½ "
Powdered starch	½ "
Tincture of carmine....................	15 drops.

HOW TO GROW PLUMP.

Kind of Food.—The first essential is a good stomach, then good, nutricious food. Digestion and assimilation must be perfect.

Meals.—Meals should be regular and substantial. Let the breakfast be of oatmeal or mush, with bread, butter, potatoes and meat. Let the dinner be of meats and vegetables, the latter in great abundance. Eat fruits at all meals.

Drinks.—Drink little at meals. If tea or coffee, use plenty of milk. Cocoa is fattening. Water is the best drink. Drink plenty of it before and after meals—not ice-water, not hot water. A tumblerful on getting up in the morning is excellent.

Sleep.—Take plenty of sleep. Take no cares to bed. Pass pleasurable evenings. Eat an apple or some appetizing fruit before retiring.

WOMANHOOD.

Exercise.—Gentle exercise must be regularly taken, but rest after a meal. If food lies heavy, start digestion with a little water and salt, a soda pinch or an approved tablet.

Bath.—A quick bath every morning in cool salt water, with a good rubbing afterwards, will stimulate the skin to perform its function unhampered by accumulations of perspiration and dust.

Results.—Nervous, pallid, anemic persons will know what nourishing the brain is by adopting the above mode of living. Food will begin to build up strength. Sleep will come to the exhausted brain. Color will take the place of pallor. The nerve centers will gain equipoise. Genuine body building and filling out will begin. And it can be kept up, too, till the desired degree of freshness and plumpness is obtained.

REDUCTION OF FAT AND WEIGHT OR HOW TO GROW THIN.

Dr. J. Madison Taylor, an expert upon this subject, advises fat people desirous of ridding themselves of cumbersome adipose and reducing their weight to pursue a course of self-treatment, of which the following embraces the essential parts.

The Chief Point.—The chief point which it is proposed to emphasize is, first, that obesity can be relieved most satisfactorily by movements and measures of a reasonable sort, not interfering with the ordinary conditions of life, and by these the very best results are to be realized.

Excessive Feeding and Disease.—It is a well-established fact that a very large proportion of the ailments of modern life, especially civilized life in temporate climates, is the direct outcome of excessive feeding. Even among the poorer classes in America there is little or no difficulty in procuring an adequate amount of food.

Proper Chewing of Food.—In almost any walk of life dyspepsia and various direct and indirect disturbances of digestion are only too common, and are most of them curable by a very simple device which the late William E. Gladstone so clearly outlined, namely, a deliberate mastication of the food. A person will be far more satisfied with a smaller amount of food if they will pursue the plan of chewing every mouthful at least thirty-two times.

Gladstone's Rule for Chewing.—This rule was the outcome of Gladstone's and others' observation of the gramnivorous animals while feeding, and he noted that they always chewed their food at least the number of times mentioned. It is a simple experiment that any one can make for themselves, that if while eating they will carefully note how long it requires for them to thoroughly masticate each mouthful and prepare it for comfortable swallowing, they will find that it occupies about the amount of time required to chew the food thirty-two times.

Value of this Rule.—If they pursue this throughout the entire length of any meal they will eat distinctly less than they might otherwise do (if the appetite be good) by chewing less frequently each bolus. The amount of food each one takes is measured much more by the pleasure which it gives than by the actual needs of the economy.

A Test of the Rule.—Any one can also test this matter by leaving in the middle of a meal and remaining away for half an hour, when they will find they do not care to return and finish, and, moreover, they will not suffer any special hunger before the next mealtime comes.

Mixed Foods Best.—The ordinary diet of most of us is fairly satisfactory, and will be followed by no disagreeable results, provided the food is deliberately taken and thoroughly masticated, and, as has been shown, if this mastication is deliberate less food will be voluntarily taken. It does not matter much whether a person eats much of vegetables or meats, it had better be a fair proportion of each, except at certain seasons.

Hot Weather Foods.—During the hot weather one instinctively omits the stimulating foods, such as meat, and takes naturally to vegetables and fruits. It is by no means wise, however, to urge any one to eat of one food simply because there is a preconceived notion, or they may be informed by some prematurely wise person that this or that article is particularly wholesome.

The Question of Drink.—The next question is that of drink. Stimuli of all sorts should be avoided by a fat person, because they, as a rule, urge on a normally flagging appetite and seem to assist in the processes of digestion. If these functions are impaired medical aid may be necessary. If these are normal the appetite is usually in excess of the needs of the middle-aged individual.

Water and Fat Making.—Water should be taken in abundance, but it is a fairly well-established fact that a large amount of water-drinking at meals assists in the accumulation of fat. A certain amount of fluid is necessary at meal times to make digestion comfortable. It is a better rule to take water (and this should be done abundantly in almost all conditions) between meals.

Mineral Spring Treatment.—The curative effects of the European spas is almost entirely due to the system and regularity of the measures pursued. These nearly always consist in going early to bed and getting up early in the morning. Also at most of these resorts the local physicians, who understand the use of the springs, first recommend a gentle walk before breakfast with the drinking of one or more glasses of water on an empty stomach. It is a peculiarly mistaken notion which prevails rather largely that the drinking of water makes fat. Fluids are necessary to normal digestion, but to interfere seriously with the normal digestion would be to impair digestion, and this is certainly not to be desired under any conditions.

The Question of Sleep.—Next comes the question of sleep. Fat people generally seem to require more sleep than thin ones. This should be combated, and naps during the day, and more than seven hours at night for men, or eight hours for women, is unnecessary unless the health for other reasons demands it. It is also fairly-well established that excessive sleep produces harmful effects, and also a tendency to sleep too much is an evidence either of inherent weakness or of slothfulness, and serves no good end.

Abdominal Pressure.—Now for the practical purpose of attacking that part of the body where over-accumulation of fat is most resented by women, namely, about the abdomen and waist, many devices are suggested. Among the most important is pressure. It is undoubtedly true that much good can be accomplished by the use of various forms of belts to press in the tissues around the waist and support the relaxed abdominal walls. In women who wish to get rid of the flesh about their abdomen the use of a snug, well-fitting belt which presses the abdominal contents upward and inward, is capable of producing excellent effects. Where the individual is not vigorous, or when any condition exists which forbids active movements and exercises (and this is very rare), these belts answer admirably.

Strengthen the Abdominal Walls.—But upon reflection it will be seen that the artificiality of depending upon such extraneous support is not to be compared in value to the education of the existing structures to do this work for themselves. If a woman with a relaxed, pendulous belly, the result it may be of child-bearing or excess in diet, it would seem a much more rational procedure to strengthen and improve the walls of the abdomen so that they themselves may hold in their own contents. It may be safely stated, as an incontrovertible fact, that where this is done the results are far better, more permanent, and to be relied upon than those artificial aids, such as the encircling band.

Using Up the Fats.—Again, a point always to be considered where women are concerned, and, indeed, not to be ignored in men, is the fact that where the tisues are taught to reacquire their normal tone and vigor, it produces a far greater degree of symmetry and a much more pleasing appearance of the torso. Where there is an excessive amount of fat or loose flabby muscle about the body the first thing to be accomplished is to use up—cause to be absorbed and otherwise to get rid of this fat, and in so doing increase the tone of the muscles, both those of the back and the encircling muscles of the abdomen. Special movements directed to this end accomplish extraordinary results in a relatively short space of time.

Acquiring a Normal Attitude.—The first thing is to acquire a normal attitude, and this is as nearly as possible that of a healthy active child of 10 or 15 years of age. To acquire this desirable attitude, place the feet and legs well under the body, the pelvis on a line, the abdomen closely retracted, the arms hanging limp and relaxed. Then drop the head lower and lower till the relaxed arms reach the floor. Hold this attitude for as long as twenty seconds, raise slowly and repeat five times. All the while the abdomen is held forcibly retracted, the breathing deep and full and slowly regular. This much is enough to occupy more than a half hour of any day, with intervals of rest and regular deep costal breathing as a further form of exercise, giving tone to the diaphragm and expanding the tissues of the thorax. It should be borne in mind that none of these exercises can in any way hurt the central organs nor imperil the integrity of the probably soft and toneless tissues. They will speedily reacquire lost tone and a pleasurable sensation will follow and not a sense of strain and fatigue, which is so liable to follow active free so-called gymnastic exercises.

The Perfect Shape.—In a perfect form it will be seen that the backbone is nearly straight, the head and chest are well balanced, the thorax is held well up, the abdomen naturally is held in. When standing the legs are well gathered under the body, and the pelvis is nearly on a level. As age creeps on, sedentary life exhibits its effects, faulty attitudes are acquired; the tendency is for the head to droop, the shoulders and chest to sag down, all the tissues about the abdomen and back settle, either in a thin or a fat person, and the pelvis has a tendency to tilt forward in front. This brings about a laxity in the tissues of the thighs, and instead of the legs being held well under the body, in the alert, graceful way, like a thoroughbred horse, they acquire one way or another ugliness which is not only obvious to the eye, but impair ease of movement and activity.

Standing Erect.—The next thing, therefore, a fat person should learn in endeavoring to get rid of his excess of flesh is to stand erect. This does not mean the faulty military attitudes so often and so carelessly recommended, but that the torso should be in itself held vertically, the shoulders should acquire their normal balance, the chest should be kept high up in front, and the abdomen forcibly held in below. This will result in bringing back the pelvis to more nearly a normal level. A good way to do is to stand with one's back to a door or flat wall, with the heels almost touching the wall, and then try to make all parts of the body touch, the head, neck, shoulders, above all, the small of the back, the buttocks and the legs come into one line. The most difficult point will be to get the neck to touch the wall. This, indeed, is practically impossible, but it should be striven for as nearly as possible, for excellent reasons.

Movements to Improve Elasticity.—Movements to improve the elasticity of the tissues lying about the loins and hips are of particular value. These may be done by stooping from a standing position till the hands reach the floor, the legs held straight meanwhile, such as are commonly directed by all teachers of physical culture. When this is acquired it should be done sitting on the floor, the legs held horizontally, the back vertical, the arms first straight down till the hands touch the floor at the side of the hips, bending the body a little forward of the line, then alternately extending and flexing the legs. Later seize the toes with the corresponding hands and repeat the alternate movements of the legs. This it will take time to acquire.

Further Useful Movements.—Finally, kneeling on all fours, advance one leg till the foot is on a line with the corresponding hand, the other leg extended posteriorly and resting on the toes, sway up and down, the back and near leg on as near a straight line as possible, repeating several times. Reverse the position of the legs and repeat. After a time the change of position can be made by a leap from the rear toes to the flat position of the forward foot. As a relief from these motions, which are rather painful at first till the contractures are overcome, stand erect and make neck movements, which will not fatigue. Let the head be thrown far out in front, from side to side, and drop down on the chest—all the time holding the chest high up, the back flat, legs stiff and straight.

The Back Exercise.—Next the small of the back should and can be made to touch the wall. This is also done by forcibly pulling in the abdominal walls and practically forcing the small of the back rearward by this effort. The arms should be allowed to hang perfectly natural, forced neither back nor front, but in an absolutely easy position. The chest should be held forceably up as high as possible, so as to force the tissues of the upper part of the thoracic walls up until the clavicles are not to be seen or felt. Among fat people these collar-bones will oftentimes stick out and show prominently. Even in thin persons who hold themselves properly these bones should not show at all. While doing this it is well to clasp the hands, turn the palms downward and push down with the hands as far as possible while pulling the chest up, and thus in this position practice and emphasize the normal acts of breathing.

Need of Perseverance.—Of course, these various postures cannot be constantly maintained, and yet the more the habit is acquired by systematic effort to do as set forth above, the more nearly will one reach the proper attitudes which not only cause a person to look far more symmetrical, their clothes to fit far better, but cause to follow different effects of a physiologic sort which result in that pleasurable condition known as perfect health. Persons who may say that the attitude thus recommended is a very forced and unnatural one have only to go and contemplate a normal and healthy child and those who are admitted to be models of physical symmetry. They will then see, unless they be blind, that it is perfectly possible to acquire and maintain an equipoise as recommended.

The Wall Exercise.—During the time that one is doing the wall exercise there should be two forms of breathing pursued. One, the long, deep breathing, about six breaths to the minute, always with the mouth closed, and through the nose, and next rapid breathing, known as sniffling, which is breathing as rapidly as possible, thus exercising the diaphragm. It is of the utmost importance, the reason for which cannot be set forth here, to acquire a thorough training for this most important muscle. A good deal more should be said about the training of the thorax by means of these costal breathings, but we must pass on to other measures directly in the line of our pursuit.

Second Wall Exercise.—Next stand, as above, against the wall, with the back and head in, the hands clasped over the head, the arms touching the walls, and raise and lower the shoulders, first slowly, then more and more forcefully, until the movements are made quite freely. This will lift up the tissues, or a very large number of them from the waist up, from their sagging, downward position, and improve the flexibility of the skin and lateral muscles as well as the anterior and posterior tissues. For the first week or two these movements should be done accurately and forcefully, but not rapidly, then a greater degree of rapidity may be acquired until these movements of raising and lowering the shoulders can be done with great rapidity and for a much longer period. Then stand away from the wall, the hands still clasped over the head and, holding the backbone as straight as before, the abdomen well in, the legs trimly under the body, rotate the pelvis, pushing the buttocks forward and back until the tissues around the waist acquire a greater degree of elasticity.

Hand-Clasped Movement.—Then a series of further movements may be made with the hands clasped behind the head, the elbows drawn forward and back so as to meet in front of the nose and to return to the lateral level of the body. This will cause a very perceptible pull upon the muscles between the shoulders, and will improve their tone. Then, with the hands still clasped as before, press the head as far forward as possible, and raise it up again, the hands resisting, until the tissues at the back of the neck acquire a thorough exercise.

Stooping Movement.—Next a series of stooping movements should be done. Stand as before, chest well up, abdomen held in, the legs held straight. Let the body fall forward, the arms perfectly relaxed and head hanging limply down; raise and lower the head and back until the fullest stretch of the back is reached. At first this will cause a rather painful feeling, but after a few days it will cease to be uncomfortable. The movements of the back should be as free as possible at the hips, keeping the legs as still as possible and perfectly straight, and allowing the body to sink down with a hinge-like motion between the hips until a greater freedom of movement is acquired.

Floor-Touching Movement.—Next a series of exercises can be undertaken by which the hands are made to touch the floor; first the finger tips and finally the whole flat of the hand, without bending the knees. To acquire this, other movements are usual, and sometimes necessary as a preliminary. Stand erect as before, holding the arms straight out on a level horizontally with the sides. Move so as to hold the right arm high in the air, the left arm touching the ground. Keep the two arms as nearly as possible in a straight line. To do this it is necessary to bend the knee slightly on the side next the arm which is down. Then raise and turn so that the right arm projects in front and the left arm back, then the right hand down to the ground. Repeat this movement first slowly and then rapidly a number of times until the method is acquired accurately. This is better done by using a pole the length of the outstretched arms, which should also correspond with the exact height of the individual, if he or she be normal.

DICTIONARY OF DRUGS.

In medical prescriptions Latin is the almost universal language. This is by agreement among medical and pharmaceutical schools, and is necessary in order that prescriptions may be read without mistake the world over. As to the drugs in a medical prescription, they bear like names in America, England, Germany, France, and all civilized countries, however much those names may differ when translated into the common speech of the respective nations. Prescriptions are, therefore, like music, comprehensible everywhere by those who write and compound them. Science demands this for the sake of accuracy, afety and convenience. Of course this is very mystifying to those not schooled in Latin, and there are not a few who say it is done for the purpose of concealing from the multitude the ingredients that enter into a prescription, or of giving the doctor an opportunity to impose on his patients. Such notions ought not to prevail. Nevertheless, one cannot be blamed for wishing to know what kind of remedy has been prescribed for him or her—what medicine he or she is asked to take. To assist in this we give a dictionary of the drugs that ordinarily enter into modern prescriptions; first, by their Latin names, and, second, by their English names.

LATIN.	ENGLISH.
Acacia	Gum-arabic
Acetanilidum	Acetanilide
Acetum	Vinegar
Acidum arseniosum	Arsenic
Acidum benzoicum	Benzoic acid
Acidum citricum	Citric acid
Acidum hydrocyanicum	Prussic acid
Acidum oxalicum	Oxalic acid
Acidum salicylicum	Salicylic acid
Acidum tannicum	Tannin
Acidum tartaricum	Tartaric acid
Adeps	Lard
Adeps lana hydrosus	Lanoline
Allium sativum	Garlic
Aloinum	Aloes
Althea	Marshmallow
Alumen	Alum
Ammonium carbonate	Carbonate of ammonia
Ammonium chloride	Sal ammoniac
Amygdala amara	Bitter almond
Amygdala dulcis	Sweet almond
Amylum	Starch
Anthemis	Chamomile
Ant. et potass. tart.	Tartar emetic
Apocynum cannabinum	Canada hemp
Aqua	Water
Aqua auranti flor.	Orange flower water
Aqua ammoniæ	Hartshorn
Aqua calcis	Lime water
Aqua chlori	Chlorine water
Argenti nitras	Caustic
Aristolochia serpentaria	Snakeroot
Arnica montana	Arnica flowers
Aspidium	Male fern
Aspidosperma	Quebracho
Atropa belladonna	Deadly nightshade
Auranti cortex	Orange peel
Aurii et sodii chlor.	Gold and sodium chloride
Avenæ farina	Oatmeal
Avena sativa	Oats
Balsamum peruvianum	Balsam Peru
Balsamum tolutanum	Balsam tolu
Benzium	Benzine
Benzoinum	Benzoin
Bromum	Bromine
Butyrum	Butter
Calamus aromaticus	Calamus

LATIN.	ENGLISH.
Calcis chloridum	Chloride of lime
Calcium carbonas precip.	Precipitate of chalk
Calendula	Marigold
Calx	Lime
Camphora	Camphor
Cannabis indica	Indian hemp
Cantharis vesicatoria	Spanish flies
Capsicum annuum	Red pepper
Carbo ligni	Charcoal
Cardamomum	Cardamom seed
Carum	Caraway seed
Caryopyllus aromaticus	Cloves
Cassia maralandica	Senna
Castanea	Chestnut
Cephælis ipecacuanha	Ipecac
Cera alba	White wax
Cetaceum	Spermaceti
Cera flava	Yellow wax
Cerevislar fermentum	Yeast
Cetraria islandica	Iceland moss
Chenopodium	Worm seed
Chloroformi	Chloroform
Chondrus	Irish moss
Cimicifuga	Black snake root
Cinchona rubra	Peruvian bark
Cinnamomum cassia	Cinnamon
Coccus	Cochineal
Colchisi radix	Colchicum root
Colchisi semen	Colchicum seed
Conium	Hemlock
Convolvulus jalapa	Jalap
Coriandrum sativa	Coriander seed
Cornus florida	Dogwood
Cubeba	Cubebs
Creasotum	Creasote
Creta preparata	Chalk, prepared
Crocus sativus	Saffron
Cupri sulphas	Bluestone
Cyprypedium pubilscens	Lady slipper
Datura stramonium	Thorn apple
Dulcamara	Bitter sweet
Digitalis	Fox glove
Ergota	Ergot
Erythroxylon	Coca
Eupatorium perfoliatum	Boneset
Fel bovis	Ox gall
Ferri citras	Citrate of iron
Ferri et quinia citras	Citrate of iron and quinine
Ferri ferrocyanuretum	Prussian blue
Ferri sulphas	Green vitriol
Ferrum	Iron
Ficus	Fig
Foeniculum	Fennel seed
Frangula	Buckthorn
Gaultheria procumbens	Wintergreen
Gentiana	Gentian
Glycerina	Glycerine
Glycyrrhiza glabra	Licorice
Gossypium	Cotton

LATIN.	ENGLISH.
Hæmatoxylon	Logwood
Hamamelis virginiana	Witch hazel
Hedeoma	Pennyroyal
Hydrargyri chloride mite.	Calomel
Hydrargyri corrosive chlor.	Corrosive sublimate
Hydrargyri oxidum rubrum	Red precipitate
Hydrastis canadensis	Golden seal
Iodum	Iodine
Juglaus	Butternut
Lappa	Burdock root
Laurus camphora	Camphor
Leptandra virginica	Culvert root
Limonis cortex	Lemon peel
Limonis succus	Lemon juice
Linimentum saponis	Soap liniment
Linium usitatissimum	Flaxseed
Liquor calcis	Lime water
Liquor plumbi subacetate	Lead water
Lotio hydrargyri nigra	Black wash
Lupulina	Hops
Macis	Mace
Magnesia carbonas	Magnesia
Magnesia sulphas	Epsom salts
Maranta aurundinacea	Arrow root
Marrubium vulgare	Horehound
Massa hydrargyri	Blue pill
Matricaria	German chamomile
Mel despumatum	Honey
Mentha piperita	Peppermint
Mentha pulegium	Pennyroyal
Methyl salicylas	Oil of wintergreen
Mistura creta	Chalk mixture
Moschus	Musk
Myristica moschata	Nutmeg
Myrrha	Myrrh
Narthex asafœtida	Asafetida
Oleum adipis	Lard oil
Oleum amygdalæ	Oil of almonds
Oleum caryophylli	Oil of cloves
Oleum cubebæ	Oil of cubebs
Oleum gaultheria	Oil of wintergreen
Oleum morrhuæ	Cod-liver oil
Oleum olivæ	Sweet oil
Oleum ricini	Castor oil
Oleum terebinthinæ	Turpentine
Oleum tiglium	Croton oil
Papaver somniferum	Poppy-heads
Pepo	Pumpkin seed
Phytolacca fructis	Pokeberry
Pigmentum indicum	Indigo
Pilulæ massæ hydrargyri	Blue mass
Piper nigrum	Black pepper
Pix liquida	Tar
Plumbi acetas	Sugar of lead
Podophyllum	May apple
Potassii bitart	Cream of tartar
Potassii nitras	Saltpeter

Latin.	English.
Prunum	Prune
Prunus virginiana	Wild cherry
Pulv. ipecac et opii	Dover's powders
Pyroxylin	Gun cotton
Quercus alba	White oak
Quercus infectoria	Nutgalls
Resina	Resin
Rhamnus pershiana	Cascara sagrada (Holy bark)
Rheuma officinale	Rhubarb
Rhus toxicodendron	Poison oak
Rosa gallica	Red rose
Rubus	Blackberry
Rubus idæus	Raspberry
Sabina	Savin
Saccharum alba	White sugar
Saccharum lactis	Sugar of milk
Sagus rumphii	Sago
Sanguinaria canadensis	Bloodroot
Santonica	Wormseed
Sambucus	Elder
Sapo	Soap
Scilla	Squills
Scoparius	Broom
Sevum	Suet
Sinapis alba	Mustard, white
Sinapis nigra	Mustard, black
Smilax officinale	Sarsaparilla
Sodæ biboras	Borax
Sodæ bicarbonas	Baking soda
Sodæ chloridum	Salt
Sodæ et potassæ tartras	Rochelle salts

Latin.	English.
Sodæ phosphas	Phosphate of soda
Sodæ sulphas	Glauber salts
Solanum dulcamara	Bitter sweet
Spigelia	Pink root
Spiritus frumenti	Whiskey
Spiritus vini gallici	Brandy
Stillingia	Queen's root
Styrax	Storax
Sulphur rotundum	Brimstone
Syrup picis liquida	Syrup of tar
Sympus rhei	Syrup of rhubarb
Tabacum	Tobacco
Tanactum	Tansy
Taraxacum	Dandelion
Terebinthinæ	Turpentine
Terebinthinæ canadensis	Canada turpentine
Theobroma cacao	Chocolate
Tinctura opii	Laudanum
Tinctura opii camphorata	Paregoric
Tragacantha	Tragacanth
Triticum	Couch grass
Ulmus fulva	Slippery elm
Valeriana	Valerian root
Viburnum opulus	Cramp bark
Vinum album	White wine
Vinum rubrum	Red wine
Vitellus	Yolk of egg
Xanthoxylum	Prickly ash
Zinci oxidum	Oxide of zinc
Zinci sulphas	Sulphate of zinc
Zinziber officinalis	Ginger

POWDER BURN.

Characteristics.—When it has been sufficient to produce rupture of the small vessels in the skin and subcutaneous tissue, an "ecchymosis" or buise is present. The skin is darkened and discolored, and grains of powder are plainly discernible in the skin. When it so injures the deeper tissues as to cause effusion of blood from rupture of some of the larger vessels "extravasation of blood" is said to be present.

Symptoms.—Burns from powder produce an effusion of blood into the skin according to the force and distance employed, first as a livid red, deep blue or black patch, which in the course of twelve or eighteen hours becomes larger and lighter at its margins. About the third day it assumes a violet tint, on the fifth an olive brown, on the sixth a green, on the seventh or eighth it has a yellow aspect.

Consequences.—A severe burn may cause a rupture of a large artery or vein, under which circumstances a fatal extravasation may ensue. The effects also vary as regards locality. For instance, in an adult a burn of this character over the scalp may be followed by a local effusion of blood, and in a child this effusion may go on so as to form a swelling which in some portions of the body may give rise to enormous enlargement. In some cases the blood thus extravasated breaks down, as it were, and considerable suppuration takes place.

Treatment.—1. In the treatment a slight burn requires but mild treatment, cooling applications, and if advisable the grains of powder carefully removed. If extravasation of blood has taken place it is to be checked by a mixture of two parts common salt to three parts saltpetre applied to the surface, or the iced poultice made as follows:—Take of flaxseed meal a sufficient quantity to form a layer from three-quarters to an inch thick. Spread a cloth of proper size. Upon this at intervals of an inch or more place lumps of ice, the size of a marble. Then sprinkle them lightly over with the meal. Cover with another cloth, folding in the edges to prevent the escape of the mass, and apply the thick side to the surface of the wound.

2. A lotion of tincture of arnica, one ounce to a pint of water, appears to be beneficial in hastening the absorption of blood, removing pain, and so forth. Some of the stimulating liniments, such as the soap or opium, may likewise be employed. In more severe cases cotton, wool or lint soaked in oil and covered with oiled silk are the best dressings. Moist applications here rather do harm and should be avoided.

SOME HINTS FROM JAPANESE TREATMENT.

Taking the Pulse.—The little finger can be used in taking a delicate pulse when it would be impossible to readily recognize it with the fingers ordinarily used.

Curing Convulsions.—Convulsions may be frequently cut short like magic by turning the patient on his left side.

Increasing Warmth.—When chilly from exposure breathe very deeply and rapidly, and the increase in bodily warmth will be surprising.

A Cure for Burns.—Crude petroleum poured upon a burned surface and covered loosely with cotton will subdue the pain almost at once.

Poisonous Wounds.—Strong spirits of ammonia applied to the wounds of snake bites or rabid animals is better than caustic. It neutralizes the poison.

Carbolic Acid Poisoning.—Carbolic acid poisoning can be quickly cured by giving cider vinegar diluted with equal parts of water in half tumberful doses every five or ten minutes for a few times.

Morphine Poison.—Permanganate of potash is an efficient antidote if taken while morphine is in the stomach. Grain for grain will completely decompose it.

Diet for Typhoid.—A typhoid fever patient will do well upon a diet of rice water.

Infant Foods.—In presenting infant foods rice is an astringent and farina a laxative.

Infantile Colic.—A towel dipped in boiling water, wrung out rapidly, folded to proper size and applied to the abdomen, with a dry flannel over the hot towel, acts like magic in infantile colic.

Pregnancy Nausea.—Vomiting and nausea of pregnancy, a 20 per cent. solution of menthol in sweet oil; use ten drops on sugar when nausea appears.

Removing Freckles.—Apply nitrate of potash to a freckled face night and morning and the freckles will soon disappear.

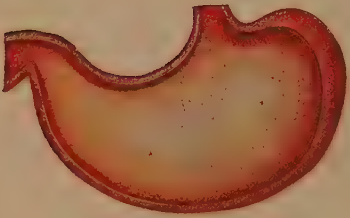
Cure for Sciatica.—Sciatica is effectually removed by enveloping the limb for one night with flowers of sulphur.

Mumps.—Turpentine is a specific for mumps.

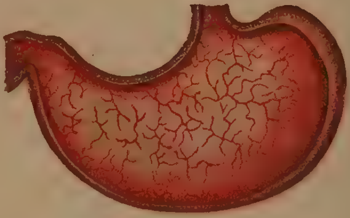
Rheumatic Joints.—Wrap a swollen rheumatic joint in cloths wrung out of ice water and the pain will almost instantly cease.

Snake Bites.—Saltpetre is a specific for snake bites. The dose is a teaspoonful for a child and a tablespoonful for an adult in a glass of cold water, applying it also to the bite.

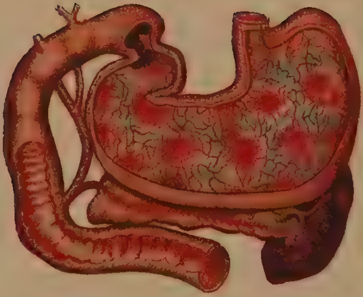
ACTUAL EFFECT OF ALCOHOLIC LIQUORS ON THE HUMAN STOMACH AND INTESTINES.



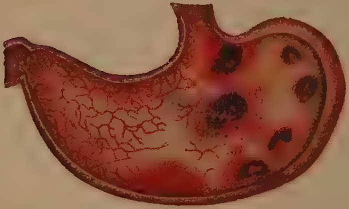
A healthy stomach



Effect of a few glasses of intoxicants

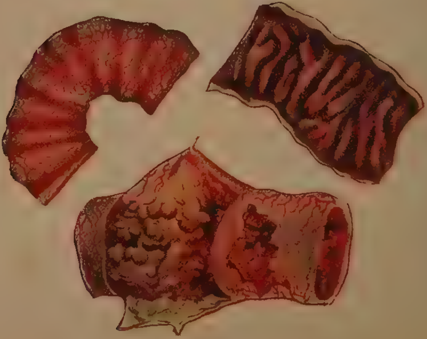


A stomach after ten or fifteen days continuous drinking.



Last stages of an ulcerated stomach of an habitual drinker of intoxicants.

Last stages of delirium tremens



Effect of intemperance on the intestines.

Cure of Opium Habit.—The most effective treatment and cure of the opium habit consists of the administration of bromide of soda. The drug is given one drachm every two hours for the first two days and one-half drachm on the third day. Two ounces seldom fail to effect a cure. See Index.

Coughs and Colds.—1. Three grains of camphor on sugar, taken every two hours, and the inhalation of spirits of camphor every half hour quickly relieves.

2. Flaxseed tea, made in the proportion of one ounce of grains of flaxseed to a pint and a half of water, boiled to a pint, with the addition of a little lemon peel, and a wineglassful taken every two or three hours is a most excellent remedy.

3. An infusion of boneset tea, made with two ounces of boneset, boiled in a pint of water and given in tablespoonful doses every three hours speedily breaks up a cold.

4. The juice of one lemon sweetened to taste, to which has been added a teaspoonful of sweet spirits of nitre, is decidedly effective. Dose: Half teaspoonful every two or three hours.

ALCOHOLISM—ITS TREATMENT AND CURE.

Narcotics in General.—The most common narcotic in use is probably tobacco, but cases which demonstrate its injury to the morals are so few that no dogmatic opinion can be given, except that its excessive use in the cigarette form, as also in the ordinary ways of chewing, smoking and snuffing, has a tendency to foster in the young inclinations destructive of a high moral tone. Hasheesh, opium, chloral, when used habitually and excessively, have been known so to injure the health and disarrange the mental action that the moral sense protests against their use. Under the prescription of a physician they may be used to allay pain or produce sleep in restless invalids, but the unprofessional use of them is extremely fatal to mind and morals, dulling and stupefying one and producing erratic action in the other. The excessive habitual use of these artificial stimulants creates a morbid moral state unfavorable to the promptings of duty, and promoting a condition unsuited to meditation on moral subjects, especially where the victim is deprived temporarily of the stimulus. The longing, the irrepressible sense of uneasiness, the restlessness, which the sufferer, deprived of his habitual ration, endures, indicates a moral as well as a mental state unhealthy and perverted.

Use of Alcohol.—The habitual and excessive use of alcoholic beverages is harmful in the extreme to the moral nature. Startling facts corroborate this opinion. They are historic. Scarcely a community is exempt from the evils of intemperance. One result most common is the loss of self-respect. Men addicted to this vice descend to the grossest immoralities. Before the taste and burning desire for liquor was acquired they were decorous and dignified; but, degraded by the demoralizing appetite, they present the most pitiable spectacle of self-humiliation, all moral excellence disowned or lost. Nor is this result common to men of moderate talents or low extraction.

Degrades Genius.—Some of the brightest geniuses have exiled themselves from the social circle of which they were ornaments, or have been banished therefrom, because of their violation of the courtesies and conventionalities of polite life. They have deliberately forfeited that conservative element in human nature on which are based true dignity and manliness.

Destroys Social Affections.—This baneful habit makes fearful inroads on the social affections. Friendships of long standing have been broken up because of the unreasonable exactions on patience and sympathy demanded by the inebriate. Drunken husbands have exercised a tyranny over refined, cultured and amiable wives till, after long years of endurance, the sufferer has gone down broken-hearted to the grave. These are not cases confined to a few families: they are numbered by the thousand.

Crushes Paternal Feeling.—The paternal relation has been made the occasion of untold pain to children who have become under the rule of an intemperate father the heirs of privation, cruelty and neglect. The paternal feeling has gradually been crushed out. There are records of feminine frailty of like character where the mother-instincts have been so far obliterated that one shudders to think of a degradation so abject being possible to the womanly nature.

Loss of Ambition.—*Loss of manly ambition* is one of the sad results of this habit. The foe has invaded the precincts of the bar, the senate-chamber, the sacred desk, and hurled down to the dust brilliant men, who sacrificed honor, purity, holiness, popular affection and flattering possibilities of wealth and fame at the shrine of this evil. This is a melancholy page in the history of many great names.

Stifles Conscience.—The great moral monitor, *the conscience*, often is made to hush its admonitions and become silent or dead. Acts the most abhorrent to men sober, by men drunk are committed without shame.

Inflamed by a species of madness produced by drink, men perpetrate the darkest deeds. In fact, criminals have fortified their failing courage by repeated draughts of liquor to nerve them to the commission of some premeditated crime. Our civil tribunals are tortured with cases which would never be brought into court but for crime committed by men in a state of intoxication. So enormous, so brutal, have been some offences against the rights of society, and of individuals as well, that serious doubts arise whether the criminal has a conscientious scruple. The wreck of this high moral authority and guide is a sad monument of depravity.

Destroys the Will.—There is another great moral force which is not exempt from the ravages of intemperance—*the will.* This power is the crowning glory of human nature. It is a gift of imperial authority with which man is dowered. When that is enfeebled or destroyed, the creature is unmanned, the sceptre falls from his hands. This regal quality may be enslaved by the vice of intemperance, and then the fate of the unfortunate victim is sealed. There is then no prospect, no promise, of reformation. The farther the victim goes, the greater the momentum toward the inevitable doom. The facility of wrong-doing and the tendency grow in a fearful ratio, until he that was a strong man in will-power is enslaved, and is impelled along on the down grade to the last asylum, the grave.

General Evil Effects.—Thus we trace the effects of a habit that has been a problem to physician, philosopher, jurist and minister. It is a question interesting to all students of human nature. The humanitarian is startled at the ruin the evil entails on the moral nature. The philanthropist cannot contemplate unmoved the arena of disaster on which scenes so terrible transpire. The ravages of the monster are universal in their extent and complete in their character. The keenest moral sense is deadened, ennobling aspirations are extinguished, moral beauty is eclipsed. Chastity is ridiculed, virtue defamed, honesty despised, honor debased. Passions reign, selfishness is supreme. All excellence loses its lustre. These and many others are the bitter fruits of this appalling evil.

Growth of the Habit.—Young and brilliant minds, noble and generous natures, yield most easily to the pressure of high artificial stimulation. At the beginning of the formation of the habit the effect on body and mind is invigorating and inspiring for a season. Life becomes during the delusive inflation a delirium of delight. The victim feels richer, more generous, more genial. The present is radiant and rosy, the future aflame with an aureole of glory. To these ignitable souls drink seems the elixir of life, the fabled nectar of the gods. But at the last, when the chains of habit are riveted, the victim, no longer free, but a slave, experiences all the horrors of remorse and self-condemnation. But his will is too enfeebled to break the shackles or resist the wand of the enchantress. He is numbered with that vast army, nearly one hundred thousand strong, who annually hasten to that dreary domain where the drunkard's journey ends.

Hereditary Effects.—These unfortunates often leave behind to their offspring a legacy of mental and moral derangement. In a work entitled *A Physician's Problems* the history of four generations of a family is given to illustrate this theory of heredity. The facts are related as corroborative of the opinion that mental and moral tendencies and characteristics of the offspring are in a large measure affected by the vicious habits of intemperate parents. Homicidal and suicidal inclinations, melancholy, disordered affections, gross impulses, were tracked along down to the fourth generation, when, fortunately, the race terminated. The reader is referred to the collection of facts in the book named as of great scientific import on this subject.

Other Food Sufficient.—There are those who have never experienced in themselves the dreadful effects of intemperance, having never used intoxicating liquors. The abstinence in these persons—and they are numerous—appears to favor the impression that except in disease no other stimulus is needed for a full mental, moral and physical manhood than that which food, rest, occupation and pure air supply. The moral well-being of the human race would no doubt be best subserved by plain diet, pure emotion and high thought.

THE KEELY GOLD CURE FOR DRUNKENNESS.

Formula of the Cure.—While the treatment of nervous exhaustion, alcoholism and so forth, is more particularly hygienic and dietetic, yet it is often impossible to dispense entirely with drugs. Recently the following formula has been widely recommended in such cases:

FORMULA.

Arsenious Acid	19 grains
Tribromide of Gold	14 grains
Bromine Water	sufficient
Distilled Water	sufficient

Ten minims of this solution for injection, which equals one-thirty-second grain of gold tribromide.

The physiological action of this remedy is most remarkable. It is an active tonic, powerful sedative and destroys the appetite or cravings for alcoholic stimulants.

Its Effects on the System.—In those forms of dyspepsia caused by indulgence in alcoholic stimulants, which are associated with the formation of gases, acid eructations and fermentative action in the contents of the stomach, in fact, where there is a retention or over-production of noxious products, the indications are to prevent the absorption of poisonous material or to destroy this poison within the organism by stimulating the liver and to eliminate the poison through the skin, kidneys and intestines. This the cure accomplishes in a most marked degree, and will give entire relief.

Combating the Evil.—Our knowledge of the method in which drugs remove the cause of disease and counteract its effects greatly increase our power of lessening suffering, but we require something more. We must combat the evils produced by disease at all points of attack.

Administration of the Cure.—The more full our knowledge of the mode of action of the new agents, the better our information about their effects upon the organs and tissues, the less likely our judgment concerning them goes astray. Knowledge of the action of drugs must be combined with careful observation of their curative influence. Therefore, having secured the right drug it must be administered as the old painter mixed his colors, "with brains." The question of age, sex, constitution, dosage, and so forth, must all be considered. Individuals of susceptible nervous temperament will require minute doses, frequently repeated. If we are treating a local lesion we apply our remedies right to the spot. So drugs have their affinities, and given in the proper indications, go straight to the diseased area. So with the cure, in nervous prostration from excesses it relieves because it is a diffusible, non-reactive stimulant, keeping the threadbare areas constantly bathed in fresh blood and giving them an opportunity to recuperate.

Effect of Alcohol.—We know that the presence of alcohol in the blood directly lessens the efficacy of respiration in proportion to the quantity present. In other words, it produces that condition in which we have a congested state of the brain. It is manifested by headache, delusions, mania, and so forth.

Accessory Treatment.—For the persistent retching and vomiting, or for the headache and wakefulness following a debauch, teaspoonful doses of fluid extract of coco, with a little elixir valerianate of ammonia, in conjunction with the cure, will be found a palatable, prompt and uniform restorative.

The Most Modern Cure.—This system is the most modern, scientific and rational, and the most eminently satisfactory method of destroying the craving and appetite for alcoholic stimulants which has yet been discovered. It permanently reinvigorates the functions, and, in fact, all the functions of the body.

The Cure Permanent.—Some treatments for the cure of the liquor craving during the past few years possessed some merit, but none of them possessed the power to effect a permanent cure of what may be termed hopeless cases. Many were benefited for a short time, but others were irretrievably injured for life by the poisonous drugs which were administered to or injected into them. None of these treatments produced lasting benefit. All of them were subject to relapses. The cause was most simple and logical, and had we the space it could be argued at length most convincingly. But in the Gold Cure treatment we have one which has never lost a patient, which has never had a relapse and which has cured every person who has taken the medicine faithfully.

Cures Even Last Stages.—This treatment takes a person suffering with the drink crave or habit, even if he has reached the stage of delirium tremens, and within three or four weeks restores him to perfect health without loss of time from business or work, and effectually destroys all appetite for liquor to which he was a slave before commencing the treatment.

Take Regularly.—We wish to particularly emphasize that the medicine is to be taken regularly four or five times a day. After a few days' use an improvement in the general health is noticeable. The medicine is absolutely harmless under all circumstances and produces no ill effects. On the contrary, it builds up the system, tones up the nerves, improves the appetite and strengthens every function of the body.

What Experience Proves.—Experience and experiments have proven that this is the only reliable, safe and permanent remedy for drunkenness. It will destroy the diseased appetite for alcoholic stimulants, whether the patient is a confirmed drunkard or a "tippler"—or a social drinker.

Perseverance Necessary.—One of the greatest obstacles in using this remedy is the over-confidence of the patient who discontinues the medicine when he begins to feel all right. It is a fatal mistake to imagine he is cured then. His system is by no means free from alcohol. If he were to die at this stage of the treatment—that is, a couple of weeks after using the medicine—and his brain be removed, it would be found so saturated with alcohol that it would burn with a blue flame, as an alcohol lamp does when a lighted match is applied. Not only is the body still impregnated with alcohol, but the nervous organism is not sufficiently restored to withstand the temptation which is sure to rise up as an evil spirit before him and lure him again to destruction.

Benefits from the Start.—The benefit of the medicine is felt from the beginning, and the patient is afforded relief at once. After three days he refuses liquor voluntarily, and each day the desire decreases until a complete cure is effected.

LIVER COMPLAINT.

Causes.—A congested state of the liver which may depend on an obstruction in the portal and hepatic venous system, in which there is a deficiency of tone in the veins which prevents the normal ascent of the blood from the lower parts of the body, thereby distending the vessels and causing an accumulation of blood. This inability of the blood to ascend against gravity is found in a great variety of chronic diseases. A very frequent cause of disease of the liver is the indulgence in alcoholic stimulants and the eating of too highly seasoned food.

Symptoms.—1. Perhaps there is no disease in the whole human frame in which symptoms assist less. In some of the more acute forms of the disease the symptoms are urgent, but except in a few instances they convey little or no information with respect to the nature or progress of the disease, and in the more chronic forms irreparable mischief is often established before the patient even suspects that there is anything wrong. There are, however, certain general symptoms which, when present, enable us to pronounce pretty positively as to the existence of liver disease, though they will not assist in determining its nature. These are dropsy, indigestion and jaundice. The tongue is generally coated and commonly furred. A disagreeable, bitterish taste is felt in the mouth, and eructations take place, sometimes bitter, cutting, acrid and even excoriating the lining of the throat. The skin may be hot and dry-parched and rough, or it may be too relaxed, giving rise to cold, clammy sweats.

2. There is no excretion, not even excepting the bowel evacuations, which is more frequently deranged in diseases of the liver than the urine. Thus, bile may be detected in the urine when no other irregularity is present by the application of muriatic acid.

3. Not unfrequently a patient has lost the power of assimilation, not from any well defined organic lesion of the liver or alimentary canal, but rather because of a stagnation of want of proper secretion through the ducts of the liver. When these become deficient in secretion the healthy action of the liver is arrested and various disorders immediately begin to

be manifested. The bowels do not move freely; the bile, instead of being excreted by the intestines, is taken up by the blood. In consequence the internal organs suffer and you have a bilious attack. After frequent attacks the skin becomes sallow, rough and yellowish, and you are affected with headache. Constipated bowels, coated tongue, pain in the right shoulder and side from the poison left behind in the blood. Here is the first seat-origin of pulmonary consumption.

4. The so-called biliousness, indigestion, capricious appetite, pain after food, eructations, acidity, flatulence, irregularity in the bowels whether as constipation or diarrhœa, point almost always to this disturbance, and it is a most potent factor in causing and inviting other diseases.

5. The modern liver is a degenerate organ; the average digestion far below the standard of old, and its function abnormally feeble and slow. Gout and uric acid congeries prevail to a remarkable extent, and the ailments, directly or indirectly attributable to mal-nutrition, meet the busy practitioner at every turn. The bilious attack of olden time, for which mercury was a specific, and that of to-day are unlike. The former was almost always the invariable penalty of a "surfeit," brought on by inordinate indulgence in the pleasures of the table, in an age when the "three-bottle man" was a hero of every convivial gathering, and the appetite on the morning following a "night out" usually unequal to the most exacting demands of a bountifully-spread board, without the aid of the seductive but dyspepsia-breeding cocktail. The latter-day biliousness, on the other hand, comes on insidiously, often without apparent cause, and follows the most trifling indiscretion in diet. The digestive organs being weak to begin with, a slight excess of intestinal decomposition is easily provoked, and the whole system becomes gradually saturated with its poisonous products. This condition, therefore, is not amenable to the mercury treatment.

Treatment.—1. The successful treatment of the modern form of the disorder is but just begun when all putrescent elements of ingested food have been carried off by purgation. The condition remaining, in which there are large amounts of slowly accumulated deposits in the system which the unaided efforts of nature are impotent to remove.

A pill composed of aloin, may-apple and nux vomica, an eighth of a grain of each, may be taken at night, or night and morning, until the bowels become regular. By their judicious use the digestion will be improved, also the general health, thereby avoiding those principal sequences which attend the constipated condition.

2. Medicines should be "arms of precision." The physician cannot

push his remedies to the limit of safety unless he has perfect confidence in their purity and accuracy. This combination accomplishes this in a threefold manner. The may apple increases the healthy action and secretion in the ducts of the liver. The nux vomica, by its stimulating and tonic effect on the stomach, enables it to better assimilate and digest the food; while the aloin completely cleanses the walls of the alimentary canal.

Through their combined action the system is restored to its normal standard. This is the secret of their curative power in the treatment of liver disease. This secret is one of immense power. They not only stimulate the brain by their action in generating more gray matter, but in some mysterious manner vivify the great sympathetic nerve which covers the bowels and energizes the eighth pair of nerves which supplies the liver. They speedily affect the liver, restore the gland to its pristine activity, the bowels become regular, the complexion clear, the breath sweet and the whole body seems rejuvenated, proving that the liver has renewed its normal function.

When the bowels do not move freely the liver becomes congested and the bile, instead of being excreted by the intestines, is taken up by the blood. In consequence the internal organs suffer and you have a bilious attack. After frequent attacks the skin becomes sallow, rough and yellowish, and you are troubled with headache, constipated bowels, coated tongue, pains in side, and your whole system feels out of sorts. For this condition take three pills on retiring at night.

For an aggravated attack of biliousness or chronic liver disease take one pill three times a day for one week. Take one pill each night at bedtime for two weeks, after which take one pill twice a week for about three weeks.

For a slight attack of biliousness, indigestion, and so forth, take two pills on retiring and one pill each night afterward until five have been taken.

Auxiliary Treatment.—When suffering from this disease the diet should first be considered. Light gruel or toast water and buttermilk or skimmed milk can be taken. Light mutton or chicken broth, after removing the greasy portion from the top. Food should not be eaten between meals, of any kind. Alcohol or malt liquors, as also tobacco, are to be avoided. For the relief of pain in the side over region of liver apply a hot hop poultice, or, what is preferable, a hot-water bag should be placed over this region and replenished so as to keep up constant heat. In severe cases the tension may be relaxed by a mustard plaster or an application of spirits of turpentine well rubbed in. This acts as a counter-irritant and often gives speedy relief. If the patient continues to vomit, a little lime-water and milk—a teaspoonful of lime-water in a cup of milk—or a mustard plaster made with the white of egg and applied to pit of stomach will frequently give immediate relief. Regarding diet, it should consist of the most bland and unirritating. All unnecessary stimulation of the liver should be removed. Fermented liquors and all kinds of stimulating food must be prohibited. Nitro-muriatic acid is highly beneficial, particularly external application as follows: Make a mixture of eight ounces of water with four ounces each of nitric and muriatic acids. Of this solution from two to five ounces are to be mixed with about three gallons of water at the temperature of 96 degrees in a high and narrow vessel and the feet kept immersed in it for about half an hour before retiring each night. If the bath does not cause a prickling sensation in the parts the next is to be increased in strength. Advantage has also been obtained from sponging the body with a similar solution each night. The patient should wear warm clothing and carefully avoid any error in diet which may cause a return of the disease. It is scarcely necessary to observe that where the disease has supervened in a warm climate removal to a more temperate region will always be advisable.

NEW CURE FOR CONSUMPTION.

BY PROF. HOFF, OF VIENNA.

The New Remedy.—From extensive experiments with this compound we have evidently discovered a new and most powerful remedy for the relief of pulmonary consumption.

A Safe and Pleasant Cure.—With it thousands have been cured who had suffered from lung troubles in their worst form; coughs, sore throat, irritated tonsils and hoarseness are immediately benefited by its use. It is pleasant to the taste and never nauseates or disagrees with the stomach in any manner. Young and old may take it with safety.

Danger of the Iron Remedy.—Among some of the remedies employed at the present time for pulmonary complaints, iron holds a prominent place. But never was ignorance more lamentably displayed in their treatment than by its use. It has swept thousands to premature graves. Iron in any form given to patients in whom the consumptive diathesis exists invariably fixes the condition and hastens the development of tubercles. The iron may induce a false appearance of health, and the physician may flatter himself that he has corrected the state of his patient, but to his surprise he will soon find the invalid relapsing into hopeless, incurable phthisis. In this condition iron seems to produce a fever in the system, which aggravates every evil symptom and proves rapidly fatal.

Cod-liver Oil a Food Only.—Cod-liver oil, once so extensively vaunted, has fallen into disrepute, and the more enlightened physicians now regard it exclusively as food.

A New Remedy Demanded.—In the management of bronchial catarrh the indication is for some remedy that will allay the irritable, dry and persistent cough, which is often the chief discomfort complained of. In this condition the cure renders the secretion fluid and it is consequently expelled with a less degree of effort. It produces a decrease of the congestion and a return of the bronchioles to their normal size. The action of the remedy is that of a sedative to the sensory nerve endings in the broncho-pulmonary structure.

Action of the New Cure.—The physiological action of the cure is peculiar, in that it does not arrest secretion in the respiratory or intestinal tract, while it has marked power to control inflammation and irritation. It stops all unnecessary and injurious coughs, relieves the soreness, quiets the irritation and brings rest.

Satisfactory Effects.—In consumption it has had a very satisfactory effect; the cough has diminished more or less rapidly, dreamless sleep followed, the sputum became looser and the appetite increased.

Supersedes all Other Cures.—It supersedes cod-liver oil in more ways than one, not the least of which is that it is palatable; consequently does not disorder digestion or produce nausea. By its use the cough is at once ameliorated, the perspiration is diminished, the patient is strengthened, thereby enabling him to expectorate the loosened mucus with greater ease, and frequently the consumptive steadily improves and regains health. In the first stages of this disease it is certainly curative, as can be verified by any practitioner giving it a faithful trial. In the preparation of the remedy the beacon light has been, namely, to prepare it for the disease.

Number of Cases Cured.—The remedy has been tried on over two hundred patients from the lowest classes, who had long been under observation. Mild cases were quickly cured and partial cures were soon brought about in severe cases. The appetite and weight were increased steadily, the fever lowered, night sweats, insomnia and asthmatic symptoms lessened, cough decreased and rattle stopped. The patients are asked only to keep the kidneys in order. The duration of the treatment depends entirely upon the condition of the patient. Mild cases are cured in two months, but the more severe require a year or two. Hoff says he does not claim for the solution the power of a magic wand, which cures at touch; but he can state this, that one of his patients had cavities in the lungs big enough to put one's fist into, yet he was cured in about two years. It is absolutely necessary that the solution should be taken after eating, when the stomach is full. The treatment must not be forced by increasing doses. As long as the patient shows signs of improvement the dose should not be increased. It is sometimes beneficial to reduce the dose.

FORMULA.

Arsenic acid	1 part
Carbonate of potash	2 parts
Cinnamyllic acid	3 parts

Heat this until a perfect solution is obtained, then add twenty-five parts cognac and three parts of watery extract of opium which has been dissolved in twenty-five parts of water and filtered.

Dose: At first take six drops after dinner and supper, gradually increasing to twenty-two drops.

PAINLESS CHILDBIRTH.

Pain is Abnormal.—In the beginning of his career the obstetrician is confronted with the question as to whether pain during labor is a natural phenomenon or not. Looking over the animal kingdom in a general way we are obliged to admit that there is more or less natural pain at this time. The question thus resolves itself into what is normal and what is abnormal amount of pain. Depending upon the individual, a normal amount of pain in one case would be abnormal in another, or vice versa. We must admit that pain at this period is of a much more abnormal character in the higher classes of human beings than in the lower. For instance, the active housewife is less apt to have the amount of pain during labor that the lady of leisure is prone to have. In both cases, however, in comparison with the lower orders of animal life, the amount of pain suffered appears to be abnormal.

Rules for Avoiding Pain.—The first duty of the obstetrician is, therefore, to lessen as much as possible the amount of pain suffered at this period. The measures to be taken must be primarily prophylactic in character, although much can be done at the period of confinement to relieve pain. During pregnancy the modern dress is to be condemned, if not at all times. The weight of both under and outer garments should fall upon the shoulders and not upon the hips and abdomen, and the waist should be left untrammeled. Corsets should not be worn at all, and, if needed, the bust should be supported by a band or girdle. Then, attention should be directed to the diet, which should be principally vegetable in character, the farinaceous foods and fruits being most freely used. Stewed and cooked fruits are especially to be recommended to the patient. Meat in small quantities should be allowed only once a day, and then well cooked.

An Easy Childbed.—There is always more or less congestion in the pelvic organs during pregnancy, which appears to increase as the time of confinement approaches. This is a natural accompaniment of the great changes which are taking place during this period, and is unquestionably the reason that in no animal life is birth unattended by pain. Here much can be done by the obstetrician to allay the possibility of pain, and, depending greatly upon his care and in the selection of his drugs, to allay this general inflammation, will be his principal success in insuring his patient a comparatively easy childbed.

Remedy Against Pain.—I know of no better remedy than the saw palmetto to come as nearly accomplishing what is expected. Its principal field of action is the pelvic organs, to which it is unquestionably an antiphlogistic tonic and anodyne. It allays the inflammation of the membranes of these organs and appears to have a soothing action on the nerve supply of the womb, ovaries and bladder. Hence, the beneficial results to be obtained by its use—in teaspoonful doses four times a day for the last eight weeks of pregnancy—is to place the organs in such a condition that pain will be reduced to a minimum.

Auxiliary Remedies.—As a prophylactic measure we would suggest daily oil massage of the abdominal and perineal muscular walls from the fifth month on, and the administration of teaspoonful doses of sweet oil, with the saw palmetto, during the last two months. If the above instructions are implicitly carried out during labor there will be little use for anything to relax the muscles and relieve pain. However, where pain to an excessive degree exists we administer chloroform in the second and sometimes in the third stage of labor. It should not be pushed to the full extent of unconsciousness. It is best administered by the patient herself. As soon as she begins to reach this stage the cone falls from her hand and is not used again until the patient fully recovers. In this way comparatively little chloroform is used and the best results obtained.

WHAT TO DO IF BIRTH OCCURS IN THE ABSENCE OF A PHYSICIAN.

In such an emergency and until a doctor arrives the midwife or attendant should know something of the nature of the presentation of the child. If a head presentation, and the birth be difficult by reason of a failure of the shoulders to pass, the forefinger may be inserted under the child's armpit, and gentle pulling exerted. This assistance overcomes the difficulty in most instances.

The Navel Cord.—Place the child to one side, beyond range of the mother's discharges, seeing, of course, that a possible wrapping of the navel cord about its neck does not interfere with its breathing, and that the mucus be removed from the mouth. As soon as the child has given signs of life by breathing and crying, and not before, tie a strong string tightly around the navel cord, some two inches from the belly, and knot it well. Do the same some four inches from the belly. Then cut the cord between the two tieings.

The Afterbirth.—Do not pull on the navel cord to help the expulsion of the afterbirth (placenta). Give time for its natural expulsion. If it prove tardy the abdomen in the region of the womb should be subjected to gentle friction and pressure by the hand. This will stimulate the womb to expel the afterbirth. When the afterbirth has passed a stout, broad bandage should be drawn firmly around the abdomen and fastened. A doctor might not use such a bandage at all, but it is well for a nurse in his absence to do so as a precaution against hemorrhage. It should be worn for several weeks.

Necessity for Rest.—The mother should not be allowed to move from her position or to exert herself for several hours after delivery. Every hour spent in perfect quiet reduces the chances of flooding. After this rest, and perhaps a little sleep with it, if a cup of warm tea has been given, the bed may be dressed, the mother not, however, changing posture. Or she may be moved to a clean bed.

The Infant.—Meanwhile the infant should have been well greased all over with lard or oil, and dressed; the next day thoroughly bathed in warm water. After being dressed, it should be placed with its mother, both to nourish itself and encourage the flow of milk. By this time a doctor should surely have arrived, and his business would naturally be to look after the further welfare of the mother and child. In this connection be sure to read the article "Labor," on page 575.

HOW TO MAKE TINCTURES.

Tinctures, in the pharmaceutical sense of the term, are solutions of medical substances in alcohol or diluted alcohol, prepared by maceration, digestion or percolation.

Only Dry Ingredients.—In the preparation of the tinctures the medicine should be in the dry state, and properly comminuted by being bruised, sliced or pulverized. It is usually better in the condition of a coarse than of a very fine powder, as in the latter it is apt to agglutinate, and this presents an impediment to the penetration of the menstruum.

The Mixing.—When several substances differing in solubility are employed they should be added successively to the splint; those least soluble first, those most so last, as otherwise the menstruum might become saturated with the ingredient for which it has the strongest affinity and thus be rendered incapable of dissolving a due portion of the others.

The Care Needed.—Care should always be taken to keep the vessels well stopped in order to prevent the evaporating of the alcohol. The materials should be frequently shaken during the digestion or maceration, and this caution is especially necessary when the substance acted on is in the state of powder. The tincture should not be used until the maceration is completed, when it should be separated from the dregs either by simply filtering it through paper, or, when force is requisite, by first expressing it through linen, and subsequently filtering.

Narcotic Tinctures.—Tinctures prepared by adding alcohol to the expressed juices of plants have been long in use. The tinctures of some of the narcotic plants, as those of conium, hyosciamus and belladonna, are prepared in this manner. To the expressed juice, after it has stood twenty-four hours and deposited its feculent matter, alcohol of .0838 is to be added in the proportion of one part by measure to four of the juice, and after another period of twenty-four hours the liquor is to be filtered. This proportion of alcohol is sufficient for the preservation of the juice while it causes the precipitation of the mucilaginous matter. But, though these preserved juices are often energetic preparations, yet it is obvious the tinctures prepared from the fresh plant must be still more efficient, as they contain necessarily not only the soluble active matter of the juice but that also which is left in the solid residue of the plant.

Keeping of Tinctures.—Tinctures should be kept in bottles accurately stopped in order to prevent evaporation, which, in some instances, might be attended with serious inconvenience, by increasing their strength beyond the official standard.

Doses of Tinctures.—Medicines are most conveniently administered in tinctures which act in small doses, as the proportion of alcohol in which they are dissolved is insufficient to produce an appreciable effect. Those which must be given in large doses should be cautiously employed in this form lest the injury done by the menstruum should more than counterbalance their beneficial operation. This remark is particularly applicable to chronic cases, in which the use of tinctures is apt to lead to the formation of habits of intemperance.

HOW TO MAKE FOMENTATIONS.

A sort of partial bathing by the application of cloths which have been previously dipped in hot water or in some medicated decoction. They act chiefly by virtue of their warmth and moisture, except in the case of narcotic fomentations, where some additional effect is obtained.

A Dry Fomentation is a warm, dry application to a part, as a hot brick wrapped in flannel, a bag half filled with chamomile flowers made hot, and so forth.

Fomentation of Herbs.—The herbs ordinarily sold by the apothecary for this purpose are southernwood, poppy heads, chamomile flowers, each two parts; bay leaves, one part. Four ounces of these to six pints of water.

HOW TO MAKE COMPRESSES.

Folded pieces of lint or rag so contrived as, by the aid of a bandage, to make due pressure upon any part, according to their shape, direction and use. Compresses have been called long, square, triangular, split, uniting, cubiform, and so forth.

The compress of the hydropathists is a cloth well wetted with cold water, applied to the surface near the supposed seat of disease, securely covered with a dry cloth, and changed as often as it becomes dry. It is sometimes covered with a layer of oiled silk to prevent evaporation.

HOW TO MAKE DECOCTIONS.

Decoctions are solutions of vegetable principles obtained by boiling the substances containing these principles in water. Decoction is preferred to infusion as a mode of extracting the virtues of plants when the call for the remedy is urgent and the greatest possible activity in the preparation is desirable. The process should be conducted in a covered vessel, so as to confine the vapor over the surface of the liquid, and thus prevent the access of atmospheric air which sometimes exerts an injurious agency upon the active principle. The boiling, moreover, should not as a general rule be long continued, as the ingredients of the vegetable are apt to react on each other and thus lose to a greater or less extent their original character. The substance should, if dry, be either powdered or well bruised; if fresh, should be sliced, so that it may present an extensive surface to the action of the solvent.

All vegetable substances are not proper objects for decoction. In many the active principle is volatile at a boiling heat, in others it undergoes some change unfavorable to its activity, and in a third set is associated with inefficient or nauseous principles, which, though insoluble or but slightly soluble in cool water, are abundantly extracted by hot liquid at the boiling temperature, and thus injure the preparation. In such cases infusion is preferable to decoction. Besides, by the latter process, more matter is often dissolved than the water can retain, so that upon cooling a precipitation takes place and the liquid is rendered turbid. When the active principle is thus dissolved in excess, the decoction should always be strained while hot, so that the matter which separates on cooling may be mixed again with the fluid by agitation at the time of administering the remedy.

As a general rule glass or earthenware vessels should be preferred, as those made of metal are sometimes corroded by the ingredients of the decoction, which thus becomes contaminated. Decoctions, from the mutual reaction of their constituents as well as from the influence of the air, are apt to spoil in a short time. Hence they should be prepared only when wanted for use, and should not be kept in warm weather for a longer period than forty-eight hours.

MEDICINAL PLANTS.

Directions for preparation and use of plants having medicinal properties, including those recently discovered.

PEACH LEAVES (Amygdalus Persica).

Everyone is familiar with the appearance of the common peach tree.

Part used—the leaves.

They are laxative and exert a sedative influence over the nervous system. They have been used for worms with reported success. An infusion is highly recommended in irritability of the bladder, in sick stomach and in whooping-cough. Half an ounce of the dried leaves may be infused in a pint of boiling water and a tablespoonful given for a dose three times a day.

PURPLE WILLOW HERB (Lythrum Salicaria).

Part used—the bark and root.

It is demulcent and astringent, and is efficacious in diarrhœa and chronic dysentery. The dose of the powdered bark is about a teaspoonful two or three times a day. A decoction of the root is prepared by boiling an ounce in a pint of water and given in doses of a tablespoonful every two or three hours.

WILD INDIGO (Baptisia Tinctoria).

Part used—the root.

It has proved useful in scarlet fever, typhus fever and in that state of the system which attends gangrene or mortification. It is highly recommended as an external application to obstinate and painful ulcers. It is given in decoction made in the proportion of an ounce of the root to a pint of water, of which two tablespoonfuls are administered every four or eight hours.

YELLOW ROOT (Hydrastis Canadensis).

Part used—the root.

Possesses the virtues of the ordinary bitters and popularly employed as a tonic. Used in dyspepsia and stomach affections, and as a topical application to ulcers and sores in the form of a decoction made with a drachm of the dried root to a pint of water and a syringeful injected three times a day. It is most useful in gonorrhœa.

MASTERWORT (Imperatoria Obstruthium).

Part used—the root.

It has been used with such beneficial effects as a diuretic, emmenagogue, stomachic and diaphoretic and in such a wide circle of complaints with so much success that it has gained the title of divine remedy. The dose of the infusion, made with an ounce of the root to a pint of water, is a teaspoonful every three or four hours.

BALSAM APPLE (Momordica Balsamina).

Part used—fruit and seeds.

A liniment formed by infusing the fruit in olive oil is applied to burns, old sores, piles, prolapsus ani, and so forth, and the fruit itself is mashed and used in the form of poultices. An extract prepared from it is useful in dropsy in the dose of from 5 to 15 grains.

WATER HEMLOCK (Phellandrium Aquaticum).

Part used—the seeds.

They have been used most successfully in chronic pectoral affections, such as bronchitis, pulmonary consumption, asthma, and so forth, and in dyspepsia and intermittent fever. The dose is from five to six grains every three or four hours.

Description.—The seeds have been used for a considerable time in the treatment of disease. They are from a line to a line and a half in length, narrow above, somewhat compressed, marked with ten delicate ribs. Their color is yellowish brown, the odor strong, their taste acrid and aromatic. In over-doses they produce vertigo, intoxication and other narcotic effects.

WALL PELLITORY (Parietaria Officinalis).

Part used—the bark.

It is used in complaints of the urinary passages, dropsy and febrile affections in the form of a decoction made with an ounce of the bark to a pint of water, the dose of which is a tablespoonful every three or four hours. The expressed juice is also used and the fresh plant applied in the form of a poultice to painful tumors.

SOAPWORT (Saponaria Officinalis).

Part used—the root and leaves.

It has been used in venereal and scrofulous affections, cutaneous eruptions, and so forth. It appears to act as an alterative like sarsaparilla.

It is given in the form of a decoction which may be taken freely. The expressed juice given in the quantity of half an ounce in the course of a day is claimed to be a specific in the cure of gonorrhœa.

Description.—The root and leaves are inodorous, of a bitterish-sweetish taste. They impart to water the property of forming a lather when agitated, like a solution of soap, whence the name of the plant was derived.

SCULLCAP (Scutellaria Lateriflora).

Part used—the leaves.

Very efficacious as a nervine and successfully employed in neuralgic and convulsive affections, St. Vitus' dance, delirium tremens and nervous exhaustion. An infusion of the dried leaves is made with half an ounce of the leaves to a teacupful of water, to be drank during the day. It has been found useful in epilepsy.

Description.—Its stem is erect, smooth and one or two feet high. The leaves are rather acute, opposite and supported upon long petioles. The flowers are small and of a pale blue color.

MUSK-ROOT (Sumbul).

Part used—-the root.

The virtues appear to be those of a nervous stimulant. It has been used with asserted success in diarrhœa, dysentery and malignant cholera; also in gastric spasm, hysteria, painful menstruation, palsy of the limbs, epilepsy and other nervous disorders. It may be given in infusion or decoction and may be used very much as we use valerian.

COLT'S-FOOT (Tussilago Farfara).

Parts used—root and leaves.

Its demulcent properties prove its efficacy in chronic coughs, consumption and other affections of the lungs. It is used in form of decoction made with an ounce of the plant to a pint of boiling water, of which a teacupful may be given several times a day.

Description.—A perennial herb with a creeping root. The flower, which stands singly, is large and yellow in color. The leaves do not appear until after the flowers have blown. The flowers have an agreeable odor.

WORMSEED (Santonici Semen).

Part used—the seeds.

They contain a volatile oil, to which its virtues have been ascribed. But it owes its efficacy to a peculiar principle which it contains called santonin, used in the treatment of worms. The dose is from one to four grains twice a day. The dose of the powdered seeds is from ten to thirty grains, which should be repeated morning and evening for several days and then followed by a brisk cathartic. It has also been employed with success in intermittent fever.

CAYENNE PEPPER (Capsicum Annuum).

The stem is thick, smooth and branching, about three feet in height. The fruit is of a bright scarlet color and contains numerous kidney-shaped, whitish seeds. A powerful stimulant. Employed with great advantage in la grippe. Two tablespoonfuls of the powder, with a teaspoonful of common salt, infused for an hour in a pint of boiling water with half a pint of vinegar. This is strained and a teaspoonful given every hour. The same is useful as a gargle. In scarlet fever the same infusion diluted gives much relief and is of positive advantage. Dose: The same.

PUMPKIN (Cucurbita Pepo).

The seeds of the common garden pumpkin are the parts employed. Have gained considerable reputation in the treatment of tape-worm, and with never-failing success. The dose is about two ounces of the seeds powdered, given at one dose in the morning, fasting, and in about two or three hours followed by a dose of castor oil. It rarely fails to expel the worm with the head attached.

TOMATOES (Lycopersicum Esculentum).

The common tomato of our own country. A remedy employed in the treatment of cholera infantum and bowel affections generally. The whole fruit is used, having been cooked with the addition of a small quantity of sugar. A teaspoonful of this is given every half hour if the symptoms are severe; less when not.

GRAPE VINE (Vitis Vinifera).

The vine is too well known to require description. Most useful in dropsy and chronic dysentery. The dried fruit is the part employed, of which an infusion is made, placing about two ounces of the fruit in a pint of boiling water, straining and cooling. Dose: A tablespoonful, in either case, every two or three hours, according to the urgency of the symptoms.

CHITTIM BARK (Rhamnus Prushiana).

A shrub about seven or eight feet in height, with branches terminating in a sharp spine. The leaves, on short footstalks, ovate and veined. The bark is officinal and the part employed. It stands without an equal in the treatment of constipation in all its varied forms. An infusion of one ounce of the bark to a pint of boiling water; infuse for one hour and strain. Dose: One teaspoonful, morning and evening, according to symptoms or until the bowels are thoroughly regulated.

OREGON WILD GRAPE (Berberis Aquifolium).

A fruit native of the Northwest. The seeds are the part employed. It is both alterative and antisyphilitic. Most valuable as a blood purifier and spring medicine generally; also in the leucorrheal affections of women. A decoction is made of the powdered seeds, two ounces to one part of boiling water, and the dose, a tablespoonful three times a day. For leucorrhea the same dose to be given internally, with a tablespoonful of same to cup of lukewarm water, to be used as an injection three times a day.

INDIAN HEMP (Apocynum Cannabinum).

A perennial plant, from three to six feet in height. The stem is erect. The leaves are opposite, smooth on both sides and about three inches long. The flowers are white. The fruit contains numerous seeds. The dried root is the part employed. Has been found most efficacious in the treatment of gonorrhea and gleet. The dose of the powdered root is about ten to fifteen grains three or four times a day.

NAVY BEAN (Vicia Vulgaris).

A smooth, green bark. Yellow flowers and pods containing the beans are the parts employed. As a remedy for erysipelas it has gained quite a reputation on account of successful cures. It is used both externally and internally. For internal use about one ounce of the dried bark is boiled with one pint of water. Dose: One tablespoonful three times a day. It is a most cooling medicine to the system. For external use a paste is made with the bruised beans and applied to the erysipelatous parts. It rarely fails to relieve all inflammatory symptoms.

BURDOCK (Lappa Minor).

Root spindle shaped, about a foot in length. Flowers purple and seeds quadrangular. The root is the part employed, and in venereal and cutaneous diseases supplants mercury, the iodides and arsenic, eliminating very rapidly the specific poison from the blood. Best administered in decoction by boiling two ounces of the root in three pints of water to two, and given in the dose of a tablespoonful four times a day.

WAHOO (Euonymus Atropurpureus).

Small shrub, which, in autumn, from their rich red color, have obtained for them the name of burning bush. Most effective in the different forms of dropsy. The root is the part employed. Given in the form of decoction, one ounce to the pint of water. Dose: A wineglassful three or four times a day.

TRAILING ARBUTUS (Epigæ Repens).

A small, trailing plant, ovate leaves and small, fragrant flowers. It has been employed with marked success in diseases of the urinary organs and of the pelvic viscera generally. The leaves and stems are the parts used. An infusion is made with two ounces of either to one and a half pints of water, boiled to one pint. Dose: A tablespoonful three or four times a day.

GARDEN ARTICHOKE (Cynara Scolymus).

A perennial plant, cultivated in our gardens. A tincture prepared from the leaves is most efficacious in rheumatic, gouty and neuralgic affections. Dose: A teaspoonful three times a day.

HOUNDS' TONGUE (Cynoglossum Officinale).

A biennial plant, named from the shape of its leaves. The root is the part employed. It has been found most useful as a sedative in coughs, catarrh, spitting of blood and dysentery. An infusion is made with one ounce of the root to a pint of water. Dose: A tablespoonful four times a day.

STONE ROOT (Collinsonia Canadensis).

This plant is used in numerous complaints in practice. A decoction of the fresh root, one ounce to the pint of water, has been used with advantage in hemorrhoids or piles, catarrh of the bladder, gravel and dropsy. The dose is one tablespoonful four times a day. The leaves are applied in the form of fomentation to wounds, bruises and sores, and in cases of internal abdominal pains.

BEET (Beta Vulgaris).

There are several varieties, differing in form, size, color and sweetness of their roots. Those of a deep red color are called blood beets, and are most extensively used. They have been found very efficacious in gravel and a number of urinary complaints, as catarrh of the bladder, inflammation of the kidneys, and so forth. For use see page 1258.

COMMON RUSH (Juncus Effusus).

A common plant, growing in water, or in wet soil, with pithy or hollow, rarely branching stems. A decoction of the root—one ounce of root to a pint of water—taken freely three times daily, is good for the kidneys, dropsy, gravel and incontinence of urine. Ashes of the rush, in doses of five to ten grains twice a day, relieves dyspepsia and sour stomach. A tincture of the rush, made by adding a handful of the plant to a pint of alcohol, and taken freely three times a day, is also good for incontinence of urine. The pith may be used as a demulcent drink in fevers.

CELERY (Opium Graveoleus).

In its wild state, as found in ditches throughout Europe, it is rank, coarse and even poisonous. One variety, the celeraic, is raised only for the root or base of the leaves. It is sweet, crisp and juicy in taste, and of an agreeable flavor. The root and expressed juice have found much favor as a remedy for rheumatism and neuralgic pains generally.

AGUE ROOT (Aletris Farinosa).

Height, from a foot to eighteen inches; leaves, pale and smooth; bears white flowers; grows mostly in sandy soils. It has proved useful in dyspepsia and flatulent colic, and is especially useful for the purpose of restoring the activity of the generative organs, giving them vigor and healthy action. A valuable agent to prevent tendency to miscarriage and falling of the womb. The dose of the tincture is from six to ten drops three times a day, and of the powdered root five to eight grains.

LADIES' SLIPPER (Cypripedium Parviflorum).

Grows in different portions of our own country and is marked for its beautiful flowers. The root is the part used. Has been used with marked success in epilepsy and in other various nervous diseases. A decoction is made with two ounces of the root to two pints of water, boiled to one and a half pints. Dose: A tablespoonful four times a day.

SWEET FERN (Comptonia Asplenifolia).

A shrubby plant. Grows in thin, sandy woods in New England. The root is the part used. Most useful in diarrhœa. Given in the form of decoction. Made with two ounces of the root, boiled in one and a half pints of water to a pint. Dose: A tablespoonful several times a day, as required.

RED ROOT (Ceanothus Americanus).

A small, indigenous shrub, growing in the United States. The root is the part employed. Said to be useful in syphilitic complaints; given in the form of decoction; two drachms of the root to a pint of water. Dose: A teaspoonful four times a day. A strong infusion is useful in aphthous ulcers of the mouth, applied locally several times a day.

BITTER ASH (Bittera Febrifuga).

A tree indigenous to the West Indies. The bark is the part used. A decoction is made with one ounce to a pint. Dose: A tablespoonful four times a day. Has been found most useful in intermittent fever, for which it is claimed to be almost a specific.

HEADACHES.

VARIOUS KINDS, CAUSES AND CURES.

This is generally a symptom of some other disorder, and can be relieved only by curing the primary trouble. There are five distinct kinds of headache, which may be described as follows:

Sick Headache.—This is caused by some derangement of the stomach and liver, and is apt to occur more or less regularly at intervals of two or four weeks. It is a most distressing form of the malady. The pain is often confined to the temples, or is most severe there; occasionally the back of the head seems most affected. There is really no trouble in the head; it is all in the digestive tract. The following method of treatment will usually cure:

Treatment.—Soak the feet in hot water containing a handful of either mustard or salt; at the same time give an emetic, such as two teaspoonfuls of wine of ipecac; or an infusion of lobelia (made by steeping two teaspoonfuls of the powdered leaves for twenty minutes in a half-pint of boiling water). Before taking this emetic, it is well to drink a half-pint or pint of some warm tea, like sage or pennyroyal. When free vomiting has occurred, give patient a little gruel and let him rest in bed for two or three hours. Then give an active cathartic.

Auxiliary Treatment.—Keep the bowels open by giving one or two cathartic pills every night for several days. Bathing the whole body with weak saleratus water often affords relief, in conjunction with this treatment; also applications of cold water to the head when the heat is intense.

Nervous Headache.—This form of headache denotes a weak, debilitated condition of the nervous system, caused by long-continued illness, loss of blood, unwonted mental excitement, etc. There is more or less stupidity and confusion of ideas, sometimes dimness of vision, and a dull pain in the head.

Rheumatic and Sympathetic Headache.—In cases of fever of any kind the heated blood passing through the brain gives rise to pains in the head that may be relieved somewhat by the application of cold water or cracked ice, but cannot be cured without removing the primary trouble. Disease of the kidneys gives rise to headache, caused by insufficient elimination of the uric acid; women often suffer from headache during pregnancy

Treatment.—These forms of the malady can only be relieved by cooling the head, as above directed. When a person is suffering from rheumatism, it sometimes seems as if the pain jumps from the affected part to the head and back again at intervals. In such cases the employment of remedies for the original trouble is required.

Chronic Headache.—Sometimes there appears a chronic form of headache, originating, perhaps, in some severe spell of sickness and persisting in spite of all remedies. This form is likely to affect some one part of the head, and whilst it may vary in intensity is seldom entirely absent.

Treatment.—The treatment consists of laxative medicines to keep the bowels always free, but without violent purging. Keep the feet warm and the circulation equalized. Diet must be plain and nourishing. A certain form of chronic headache sometimes accompanies catarrh, and is relieved only by curing the catarrh. As a good general rule—keep the feet warm, the head cool, the skin clean, and the bowels open.

Plethoric Headache.—This type of headache most affects persons of full habit, and is caused by too great flow of blood to the brain. It can easily be recognized; stooping down and then raising the head gives a sense of fullness and pain; suddenly jarring or shaking the head aggravates the pain; blowing or straining, or pressure on the neck gives rise to pain, with more or less giddiness. Sometimes the excess of blood in the brain indicates an over-supply all through the body; in other cases it is caused by a derangement of the circulation, other parts of the body suffering from an insufficient amount of blood. In the latter case the extremities will be cold while the head is flushed and hot, with severe throbbing sensations.

Treatment.—In such cases the feet and legs must be soaked in hot mustard water, with a sprinkling of cayenne pepper, and thoroughly rubbed with a coarse towel. Give an active hydragogue cathartic (see pill recommended under pleurisy), repeat every three days, if necessary, until complete relief is obtained.

Diet.—Diet should be light and unstimulating—fruits, oatmeal porridge, etc.

IMPOTENCY IN FEMALES.

Causes.—Our present high-pressure system of education does not favor the development of the organs of generation in women. But, aside from this, sterility may be caused by faults in the ovaries, absence or imperfect development, displacements, inflammations or degenerations, faults in the oviducts or fallopian tubes, faults in the uterus, faults in external organs.

Treatment.—Correct morbid condition of the vagina. Overcome contractions of entrance to the uterus by dilatation. Morbid conditions in interior of womb must be remedied by direct applications. Hot injections or baths are of great service in removing inflammations. All in all, it may be easier to prevent sterility by a suitable physical development of girls than to cure it in many cases.

IMPOTENCY IN MALES.

Causes.—Advanced age, weakness, disease of testicles, apoplexy or injury to the head may extinguish the sexual desire, diseases of the spinal cord, want of self-confidence, excessive and too early indulgence in sexual intercourse, constitutional complaints, diseases of the kidneys, malformations.

Treatment.—The most direct and useful remedy is cantharides, in ten- or fifteen-drop doses every three or four hours previous to desired intercourse. Dilute phosphoric acid, phosphate of iron and ergot of rye are also valuable remedies. A newly-married person who is impotent from lack of confidence should not get disheartened. A full understanding of his situation and a reassertion of confidence will prove of more avail than medicines.

SYPHILIS.

A NEW TREATMENT.

No Former Specific.—Under the former methods of treatment there was no remedy in the pharmacopœia which could be relied upon as a specific for syphilis, although there were many that had a very beneficial influence in aiding the disappearance of the symptoms. It was then, indeed, a question whether the disease could ever be effectually cured.

Mercury Not Relied On.—In former times it was thought that in mercury we possessed a specific against the disease, and when all sores were looked upon as syphilitic, and mercury was administered, a large proportion of supposed cures were recorded. In our modern times, however, the supposed success of the mercurial plan is not recognized.

The New Specific.—Recent investigation and research have brought to light a remedy called "Succus Alterans," which is as much a specific for syphilis and blood-poisoning as quinine is for intermittent fever. Mercury and the iodides produce injurious effects if long continued, and should be avoided. Patients who have been treated by the old plan improve rapidly after taking succus alterans. In some patients an itching is produced; in others an eruption on portions of the body or limbs; in a few, watery blisters in the palms of the hands and soles of the feet which require no particular attention except to cleanse them with water, adding a few drops of carbolic acid.

Comparison of Treatments.—The new treatment is a certain antidote to blood-poison, and increases the number of red corpuscles in poor blood, while mercury and the iodides produce a condition of the system infinitely worse than the disease it is sought to cure.

Effect of the New Treatment.—The effect of succus alterans as a constitutional remedy rests, unquestionably, in its power of eliminating specific poison from the blood, and in its tonic power, increasing the proportion of red corpuscles in impoverished blood, thus enabling the system to throw off disease. The dose of this remedy is one teaspoonful four times a day.

ANOTHER TREATMENT FOR SYPHILIS.

Considerable success has been reported from the use as an alterative of the black oxide of mercury in doses of one-half grain daily. It is frequently used in fumigation with marked success, the patient being placed, covered with undergarments, in a vapor bath and exposed for fifteen or twenty minutes to the vapors arising from two drachms of the oxide put upon heated iron within the bath.

Auxiliary Treatment 1.—The different vegetable decoctions, of which sarsaparilla takes the lead, assist digestion, promote the action of the skin, encourage the functional activity of the kidneys and please the patient. They may be adjuncts in certain cases, but they have not merited by their action any right to the term curative in its narrowest sense, since they do not demonstrably postpone relapses or shorten the duration of existing symptoms any more than other hygienic or tonic means.

Auxiliary Treatment 2.—The hygienic treatment of syphilis includes all the ordinary laws of health. Regularity of habits, especially those of eating and sleeping and those involved in the performance of intestinal functions, is all important. No deviation need be made from ordinary diet. Excesses of any kind are bad, especially excesses in strong drink, in work, in venery. The function of the skin should receive attention through scrupulous cleanliness. Warm baths are more cleanly and relaxing to the skin than cold. Catching cold should be avoided. It is apt to induce and prolong mucous and ulcerative patches about the mouth, nose and throat. Experience has taught that tobacco in all forms, and even highly-seasoned food, is certainly injurious in irritating and keeping up an outcrop of mucous patches. Air, exercise and light, essentially necessary to all animal well-being, are particularly so in the case of obstinate or chronic disease. Change of air in some of these cases is essential to the success of treatment.

Auxiliary Treatment 3.—In the same category with hygiene belongs all tonic and supportive medication. Iron quinine, the vegetable bitters, and so forth, all vindicate their claims in the treatment. There are, however, certain phases of syphilitic cachexia over .which no tonics act with the same effect as minute doses of the black oxide of mercury, sometimes preferably combined with iron.

GONORRHEA.

A NEW TREATMENT.

Treatment by Cystogen.—There are few who cannot recall the days of balsam copaiba and zinc injections. What a change in the treatment of disease—the antiseptic or germicidal treatment of the modern day! In the treatment of any disease of the genito-urinary tract the urine should be rendered sterile. Experiments made with cystogen prove conclusively its value as a genito-urinary germicide, and the brilliant results obtained from its use places it foremost among the remedies of the genito-urinary specialist. In gonorrhea, acute and chronic, it serves to restrict the area of infection and prevent reinfection. Obstinate cases that have resisted other treatments should be placed on cystogen, in five-grain doses every three or four hours. It will clear up the urine without perverting its chemical reaction. The trouble with agents which make the urine alkaline is that they are incompatible with the gastric juice and must be given in doses large enough to more than neutralize the acid of the stomach. Cystogen preserves the acidity of the gastric juice and produces an antiseptic irrigating fluid of the urine without nterfering with the digestion or irritating the kidneys.

The Sanmetto Treatment.—We have also another agent possessing wonderful specific influence over the urinary organs when there is irritation or inflammation. It is called sanmetto, and is a combination of sandal wood and saw palmetto. It acts as a great vitalizer, increasing the strength of the reproductive organs, hastening their action, promoting their secreting power and increasing their size. The usual dose is a teaspoonful four times a day.

It is generally recognized by the profession that there is no disease which is so common and presents as many dangers to the human race at large as gonorrhea. The greatest danger lies in the fact that medical men are apt to be careless about the treatment. No man can pronounce his patient well and be sure that his urethra is free from the specific microörganism unless he is able to make a thorough bacteriological examination of the patient's urine and of any discharge which may issue from his genito-urinary organs. The great source of general infection is the man who is told that he is "over his dose" because his discharge is apparently checked and he is able to urinate without using bad language at every dripple of urine. He is sent away with a host of virulent microörganisms lying extant in his urethra.

Track of Gonorrhea.—The urethral inflammation commences at the meatus and travels slowly backward. There is no ulceration. The disease tends to limit itself and to become localized at the bulb, where the disease runs its course. Instead of getting well we have gleet, in which there is a certain amount of sticky fluid, often only a drop at the meatus in the morning continues to be secreted after gonorrhea, from altered patches of the urethra, or coming from the stretched and congested membrane behind a stricture. Gleet, then, is a symptom of two structural lesions, and signifies that there are patches of congestion in the canal, covered or not by granulations, or that stricture exists, and that the discharge comes from behind it. When an individual with a gleet is found to be gouty it is particularly advisable to enforce strict urethral hygiene.

Gonorrheal Complications.—Of the complications of gonorrhea we may have inflammatory phymosis, chordee, retention of urine and hemorrhage. The idea of aborting gonorrhea by the internal use of balsams has been abandoned. By abortive treatment is now understood the injection of any irritating soluble substance into the urethra for the purpose of inflaming the canal. Of these substances is nitrate of silver, of the strength of half a grain to one ounce of water, the injection being carefully repeated every two or three hours until a trace of blood is seen in the discharges. Then all treatment must cease. The syringe used in the abortive treatment should never hold more than two drachms, and the fluid injected must be brought well into contact with every portion of the first inch and a half of the urethra.

In true gonorrhea the abortive treatment will not avail after the disease is more than forty-eight hours old.

Indian Hemp Remedy.—We then rely upon the Indian hemp, or cannabis indica, in doses of one-third to half a grain three or four times a day. It acts beneficially by passing off in the urine and cleaning out the urethra. In those complications of gonorrhea in which we have to cease injections on account of cystitis, prostatitis, and so forth, this drug is greatly to be recommended. We have repeatedly observed cases of acute catarrh of the bladder, with bloody urine, improve considerably, and the urine become clear after a few doses of the drug. In old cases of cystitis and prostatitis it was also beneficial and always acted favorably and cleared up the urine. It has also been used with success in inflammation of the neck of the bladder, suppurative nephritis or kidney disease, chronic catarrh of the bladder, vesical catarrh of old age, complications of Bright's disease, bloody urine and specific and non-specific urethritis.

In accordance with the results obtained it should be given in the first stages of gonorrhea to spare the patient the vexation of a prolonged discharge and the urinal scaldings, which, when connected with urethral catarrh and slight cystitis, increasing the frequent desire to pass water, amount to positive torture.

Bearing this in mind, we lay down the rule, that as soon as the disease has declared itself, without waiting for the diminution of the inflammation, we commence by giving one-third grain of cannabis indica, four times a day, and after second day increased to one-half grain. Toward the fourth day, when the discharge has become serous and reduced, the dose should be gradually diminished.

In cases of simple nephritis, stricture of the urethra, acute cystitis, albuminuria, with puffiness in the face and limbs; catarrhal affections of the bladder and of the urinary organs, the dose is one-half grain two or three times a day until every trace of mucus has disappeared from the urine, which then becomes quite clear and limpid.

TOBACCO HABIT AND CURE.

Nicotine.—There is no deadlier poison in nature than Nicotine. A drop or two of nicotine is sufficient to cause death. Like all poisons it is highly stimulating for the instant, soon to be followed by its death-like effects. It is the peculiar poison which tobacco in any and all of its forms yields. The tobacco chewer, snuff taker, cigar smoker, and cigarette fiend, no matter what his or her reason be for indulgence in the weed, is simply administering poison to the vitals.

Excuse for the Habit.—To be sure the administration of poison to oneself through the agency of the plug, cigar, cigarette or snuff is not immediately dangerous. Many excuse such unwise administration on the plea that tobacco calms their nerves and conduces to sleep and comfort. Others say it is a sedative that conduces to thought. It is generally supplied to soldiers on the theory that it keeps them contented in camp, enables them to better withstand the fatigue of long marches, and in a limited sense supplies the lack of food. But most, if not all, of these claims are imaginary. They are made, as a rule, by slaves of the habit, and as a justification of their folly.

Tobacco Facts.—The boy or girl who uses tobacco before reaching maturity is sure to wreck the nervous system and take a long step toward idiocy or insanity. Perfect, clean, energetic and acceptable manhood or womanhood is impossible for a youthful tobacco poisoner. No matter how slowly the administration of the poison may be, it is relatively quicker in its action than upon older people, because young nerves are the more tender and sensitive, more easily affected. The business world, as well as polite society, is fast making the use of tobacco, as of alcohol, a test of qualification in employment. As between the user and non-user of tobacco the latter is preferred every time. The youth who uses tobacco before maturity is his own greatest enemy, and readily ranks as a crass fool.

Adult Tobacco Users.—It is to be doubted whether any sane adult ever deliberately learned the tobacco habit. They either imitate others, lest they appear odd, or the habit has crept insidiously on them. Again it is to be doubted whether a sane man exists who does not deprecate the habit and wish he were rid of it, and this deprecation exists in spite of the fact that he is ready with excuses for indulging the habit. In this respect tobacco users are open to the charge of inconsistency.

The Force of Habit.—Habit is a hard master, a veritable tyrant. It gloats in its triumphs and laughs while its slave writhes. So tyrannical and brutal is it that, as in the case of alcohol, it causes such degeneracy of tissues and organs as to take rank with actual disease, that of alcoholism. This is in some sense true of the tobacco habit. The difficulty of ridding oneself of it leads to the belief that it really weakens the will power and those forces which contribute to moral self-control.

Uselessness of the Habit.—No non-user of tobacco ever felt the worse or expressed regret over his abstentation. No user of tobacco ever denied that the habit is

1st. A filthy one, in that it begets frequent spitting of stained saliva by chewers, sickening smoke odors by smokers, and discharge of discolored mucous by snuffers. Add to this the disgustingly odorous smoke of the cigarette-fiend, and then wonder what worse in the way of filth can be realized.

2d. No matter what the natural constitution or the excuse, the habit is a dangerous one. It grows by what it feeds upon, and leads to gradual and insidious wreckage of the finer sensibilities and active nerve forces.

3d. It is an expensive habit, often entailing poverty, and always diminishing the recompense of labor. In the families of those who earn meagre support its expensiveness is almost the equivalent of robbery of wife and children. Destitution lies in the wake of tobacco almost as surely as in that of alcohol.

4th. It is an inconvenient habit and very often interferes with work, however much some may claim that it increases the ability to work.

Is There a Cure?—Yes. But not outside of the man's self. To introduce tobacco substitutes is not to cure, for very often the whole tobacco habit consists in the mere presence of a quid in the mouth or a cigar in the mouth. To keep the nervous system up to the tobacco tone by means of drugs would be to introduce into the system something which might lead to worse results than nicotine poison. It is all with the man. He should bring his mightiest will-power to bear upon the habit. He should never forget all the inconveniences and harmful results of indulgence. Bear them in mind; magnify them, if possible. Shape up every fibre to combat the situation. Resolve to be a free man. Persevere in the resolve. Weaken at no point of conflict nor at any time. Two or three weeks of abstentation will brace the will-power. It will feel encouraged by triumph, will grow stronger and stronger, and finally rejoice in entire mastery of the habit.

CONSUMPTION A CURABLE DISEASE.

Dr. S. A. Knoph, a celebrated New York specialist on consumption, who took the 1899 prize for a treatise on the disease, regards it as curable, and has the following to say of it:

Havoc of Consumption.—When it is considered that in the United States alone there are 100,000 deaths a year due to this disease it will be seen how important is any effort made to stamp it out.

Causes.—Pulmonary consumption or tuberculosis of the lungs is a chronic disease caused by the presence of the tubercle bacillus or germ of consumption in the lung. This little parasite soon destroys the lung substance through ulcerative processes, but gives off at the same time certain poisonous substances called toxins which give rise to various and often serious symptoms.

The Germs.—The tubercle bacillus appears in the form of minute slender rods. It may be taken into the system in three ways—breathed into the lungs, eaten with affected food or taken into the blood through a wound in the skin.

Spreading the Germs.—The greatest factor in the distribution of these germs does not make very pleasant reading, but it is so important that it cannot be omitted. The saliva of the consumptive is full of the germ. Every time he expectorates he distributes these germs; they dry and are pulverized and are taken up in the form of dust to be breathed into the lungs of other persons. For this reason it is most important in combating consumption to be extremely careful of cuspidors in public places; they should always be partly filled with water in order to prevent the germs from drying and should be thoroughly cleansed and fumigated.

Danger from Saliva.—Small particles of saliva containing bacilli are thrown out by the consumptive during dry cough, loud speaking or sneezing. There is danger from this source of infection only when one remains a considerable length of time very near the tuberculous patient. At a distance of three or four feet the danger practically ceases. But on falling to the floor these bacilla dry and are taken up with the dust;

therefore, the room of a consumptive should never have any fixed carpet and even the wooden floor should never be swept with a broom, but should be frequently wiped up with a wet cloth or with crude oil.

Hereditary Consumption.—Even the hereditary disposition to consumption can be overcome if proper methods are taken. A separate bed should be provided for the child of a consumptive mother, and there should be as much exposure to warm air as possible. It is a good plan to let the little one run about naked, or with only a little shirt on, for a while every day in a warm sunny room; a bare wooden floor or a square of closely-woven matting that can be kept scrupulously clean is much to be preferred to dust-collecting carpet. From the tenth to the twelfth month one should accustom the child gradually to cold baths.

Exercise.—As soon as the intelligence of the grown child will permit it should be taught to take the following breathing exercises, which the child should learn to love as the average boy or girl loves general gymnastics: In front of the open window, or out of doors, assume the position of the military "attention," heels together, body erect, and hands on the sides; with the mouth closed take a deep inspiration, and while doing so raise the arms to a horizontal position; remain thus holding the air inhaled for about three seconds, and while exhaling (breathing out) bring the arms to the original position. This act of exhalation, or expiration, should be a little more rapid than the act of inspiration.

Exercise II.—When the first is thoroughly mastered and has been practiced for several days one may begin with the second exercise, which is like the first, except that the upward movement of the arms is continued until the hands meet over the head.

Exercise III.—The third breathing or respiratory exercise, which requires more strength and endurance, should not be undertaken until the first two have been practiced regularly several times a day for a few weeks and until an evident improvement in breathing and general well-being has been observed.

Take the same military position of "attention" and then stretch the arms out as in the act of swimming, the backs of the hands touching each other. During the inspiration move the arms outward until they finally meet behind the back. Remain in this position a few seconds, retain the air, and during exhalation bring the arms forward again. This somewhat difficult exercise can be facilitated and be made more effective by rising on the toes during the act of inhalation and descending during the act of expiration.

Further Exercise.—Of course, when out of doors one cannot always take these exercises with the movement of the arms without attracting attention; under such conditions raise the shoulders, making a rotary backward movement during the act of inhaling; remain in this position, holding the breath for a few seconds, and then exhale while moving the shoulders forward and downward, assuming again the normal position. This exercise can be easily taken while walking, sitting or riding in the open air.

Stooping Shoulders.—Young boys and girls, and especially those who are predisposed to consumption, often acquire a habit of stooping. To overcome this the following exercise is to be recommended: The child makes his best effort to stand upright, places his hands on his hips with the thumbs front, and then bends slowly backward as far as he can during the act of inhaling. He remains in this position a few seconds, while holding the breath, and then rises again somewhat more rapidly during the act of exhalation.

Rules for Breathing Exercise.—The following general rule concerning breathing exercises should always be remembered: Commence with the easier exercises and do not begin with more difficult ones until the former are completely mastered. Take from six to nine deep respiratory exercises, either of one kind or the other, every half hour, and continue this practice until deep breathing has become a natural habit. These exercises should always be taken in an atmosphere as fresh and as free from dust as possible. Never take these exercises when tired, and never continue so long as to become tired.

To Avoid Mouth-Breathing.—Mouth-breathing in children and sometimes in adults is often caused by certain growths in the throat (adenoid vegetation), by enlarged tonsils, or by growths in the nose (polypi, etc.). The removal of these obstructions by surgical aid is perhaps the only rational method to assure natural breathing. Incidentally, we may be permitted to say that these operations are not at all dangerous; but by the presence of these vegetations in the throat (retropharynx) the hearing and the intellectual and bodily development of the child may become seriously impaired. The early removal of such growths should be earnestly recommended. The respiratory exercises above described are particularly useful for such children after operation, otherwise they might retain the habit of imperfect breathing, which they had acquired.

Among exercises which have a tendency to develop and strengthen lungs and throat we will also mention singing and reciting in the open air.

What Predisposes to Consumption.—A predisposition to consumption other than hereditary can be created or acquired, 1st.—By the intemperate use of alcoholic beverages, a dissipated life.

2d.—By certain diseases which weaken the constitution; for example, pneumonia, typhoid fever, small-pox, measles, whooping-cough, influenza, and so forth.

3d.—By certain occupations, trades and professions, such as printing, hat-making, tailoring, weaving and all occupations where the worker is much exposed to the inhalation of various kinds of dusts.

The hygiene of factories, work shops and dwellings is a most important factor in overcoming these dangers.

Combating Consumption.—The cleanliness of the body; the regularity of meals and reasonable hours of work will help combat the germs of tuberculosis. To be cheerful, to live a regular life, to eat plain but good food, to avoid all alcoholic beverages, to keep the system free from impurities, to keep the whole body clean, to sleep at least eight hours out of the twenty-four is the best way to remain well.

Danger from Cattle.—Tuberculosis in cattle and other animals is of the utmost importance, for from them man can get the germs and take them into his system.

Curability.—All who have made the disease a study have for years come to the conclusion that tuberculosis, especially in its pulmonary form, is not only a preventable disease but one which can in the majority of cases be completely and lastingly cured. It is certainly within the power of man, living in a civilized country, such as the United States, where so much intelligence, wealth, prosperity and philanthropy prevail, to combat tuberculosis as a disease of the masses most successfully.

HOW A CHILD GROWS.

In Twenty-Five Years.—At birth the average male infant weighs 7.5 pounds and is 20.6 inches long. The average man of 25 has a stature of 68.3 inches and a weight of 148 pounds. Thus in the twenty-five years the stature becomes about three and one-third and the weight about twenty times the corresponding measurements at birth.

First Year's Growth.—During the first year the boy gains in height 8.4 inches and in weight 13 pounds, or, expressed in percentage, the gain in height is 41 per cent. and in weight is 173 per cent. Not only are these percentages of annual increase never again even approximated in the growing period of the individual but the actual increase is never again reached in any one year.

Second Year's Growth.—During the second year of life the rate of change slackens rapidly, and while growth and development still proceed the processes go on at a very moderate rate compared with that of the first year.

First Year Dangers.—The first year of a child's life is the period of greatest internal activity, of greatest plasticity, of greatest adjustment to surroundings. Hence it is the year of greatest mortality.

First Year Mortality.—The mortality in this year of life, as shown by English statistics, is about 15 per cent.—a rate not again reached until the age of 80. In many cities infant mortality reaches a much higher figure. It is also important to note that much of the mortality of infancy occurs in the early part of the first year. Thus Julius Eross, who studied the statistics of sixteen large European cities, and whose study included over 1,400,000 children, found that 10 per cent. of the children born alive died within the first four weeks of life. The mortality of the first year of life is about double that of typhoid fever, so that it is no exaggeration to say that to be an infant under one year of age is twice as dangerous as to have typhoid fever, although the danger decreases with each week of life.

Second Year Mortality.—After the second year growth proceeds in a fairly even way until the age of about 11 or 12 years is reached, when an acceleration occurs lasting from three to five years.

Man's Growthy Period.—With the exception of the elephant man has a longer period of plasticity, or of development, than any other animal. Man's plastic period lasts twenty years. During its growing period the elephant has an enormous bulk to acquire and most of its growth processes must be directed to that end. Influences which would act strongly to differentiate the young elephant from its hereditary tendencies would necessarily tend to interfere with its acquirement of bulk and hence make is less liable to survive, which would prevent the establishment in the species of any variation so produced. The great reason, after all, why it has not evolved higher lies in the failure of the elephant's brain to develop, which is itself the result of the highly specialized structure of the animal.

Danger of Rapid Growth.—Rapid growth is antagonistic to permanence of environmental impressions and is inimical to the life of the individual, at least in the case of the human infant.

When the Individual is Safest.—The individual is safest when his development follows most closely the average or mean. There are many instances which illustrate this. Infants whose size and weight are much above the average for their age are generally anæmic and are notoriously difficult to nourish.

Defective Livers.—Children who are born with livers ill developed in function are the victims of many pathological processes, some of which cause merely suffering, others involve the future life and health of the individual, and still others threaten, and at times actually destroy, life.

Growing Too Fast.—The girl or boy who, at the age of 13 or 14, has a much greater acceleration of growth than normal puts so much energy into this process that excessive fatigue results, and if the ordinary vocations are continued the child is often permanently damaged. Growth sometimes occurs so rapidly that the heart cannot keep up with the increased work thrown upon it, becomes overworked and is damaged to the extent that it is neglected. The most striking illustrations of this truth are to be found in the cases of unusual precocity which from time to time have been noted.

Average Growth Best.—The average is best for the individual, and while advancement of the race demands deviation from the average no altruism yet evolved requires one to welcome or foster it.

Great Growth at Birth.—At birth there is a great range of the degree of growth and development of the several organs of the body. Those upon which the maintenance of life directly depends are necessarily developed quite highly and their nervous connections are well established. The heart is quite as capable at birth of performing its functions as it is at any later stage. Its subsequent change is principally one of growth. The lungs and kidneys are also highly developed at birth.

Poorly Developed Birth Organs.—The gastroenteric tract and its adjuncts, on the other hand, are not nearly so well developed. While the proper action of the stomach and bowels is quite as essential to the maintenance of life as is the proper action of the heart, their deficiency in development is met by the highly specialized food of the infant. The liver, the great chemical laboratory of the body, like the stomach and bowels, is incompletely developed functionally, and to a greater degree than these other organs. The same special condition of food which favors the gastroenteric tract also generally saves the liver and permits it to be competent to do the work thrown upon it.

Most Immature Birth Organs.—The most immature organ of all at birth, and the one in which the greatest changes are subsequently to occur, is the brain. Its weight at birth is about 12 to 13 troy ounces, which is about 12½ per cent. of the whole body weight. At maturity, at the age of 20, it has acquired a weight of about 45 troy ounces in the male and about 37 troy ounces in the female, but at this age it constitutes in both sexes somewhat less than 2½ per cent. of the whole body weight.

Brain Growth.—The growth of the brain is very rapid during the first year of life and much less in subsequent years, but by the seventh year it has attained fully 90 per cent. of its total future weight. While the processes of growth and development go on together, in the first seven years the brain change is preëminently that of growth and thereafter preëminently that of development. No organ of the body can be affected so much by proper training as the brain.

YELLOW FEVER AND MOSQUITOES.

Rules Advised by General Wood.

Army medical officers are thoroughly satisfied with the reports of the experts in that department that the mosquito is the principal agent in the dissemination of yellow fever. Acting upon these reports Major-General Wood, commanding the Department of Cuba, has issued an order which means energetic war against this insect. The following is the order as sent out by him on the subject:

"The chief surgeon of the department having reported that it is now well established that malaria, yellow fever and filarial affection are transmitted by the bites of mosquitoes, the following precautions will, upon his recommendation, be taken for the protection of the troops against the bites of these insects:—

"1st. The universal use of mosquito bars in all barracks and especially in all hospitals, and also in field service when practicable.

"2d. The destruction of the larvæ or young mosquitoes, commonly known as 'wiggletails,' or 'wigglers,' by the use of petroleum on the water where they breed.

"The mosquito does not fly far and seeks shelter when the wind blows; so it is usually the case that each community breeds its own supply of mosquitoes in water barrels, fire buckets, post holes, old cans, cesspools or undrained puddles.

"An application of one ounce of kerosene to each fifteen square feet of water, twice a month, will destroy not only all the young but the adult females who come to lay their eggs. The water in cisterns or tanks is not affected for drinking or washing purposes by this application if only it is drawn from below and not dipped out.

"For pools or puddles of a somewhat permanent character draining or filling up is the best remedy.

"The medical department will furnish oil for purpose above mentioned.

"Post commanders will carefully carry out these precautions."

ONANISM OR SELF-POLLUTION.

EFFECTS AND REMEDIES.

How Regarded.—Some medical writers treat this worst of all youthful, and even adult, practices as a habit, others as a disease, still others as a crime. It is all three, dependent on ages, physical conditions and surroundings; but, beyond everything, is a crime against nature, punishable by consequences that are simply appalling.

When to Suspect.—Surprising artfulness and obstinacy are employed by young people in maintaining secrecy respecting crimes of this description. But a youth may be suspected, when, at the period of puberty, he seeks to remain in solitary places generally alone, more rarely with a particular comrade.

Terrible Effects on Conduct.—This vice soon renders him careless of his parents and the persons who have the care of him, as well as indifferent to the sports of his equals; he falls into a distaste for everything except the opportunity of indulgence; all his thoughts are directed to the parts at this period subject to irritation; sensibility, imagination and passion are inflamed; and the secretion of the reproductive liquid augmenting, withdraws a very precious portion from the blood.

Havoc on the Body.—The muscles of the youth consequently become soft; he is idle; his body becomes bent; his gait is sluggish, and he is scarcely able to support himself. The digestion becomes enfeebled; the breath, fetid; the intestines, inactive; the excrements, hardened in the rectum and producing additional irritation of the seminal conduits in its vicinity. The circulation being no longer free, the youth sighs often; the complexion is livid, and the skin, on the forehead especially, is studded with pimples.

Effects on the Face.—The corners of the mouth are lengthened; the nose becomes sharp; the sunken eyes, deprived of brilliance and enclosed in blue circles, are cast down; no look remains of gayety; the very aspect is criminal.

Ruinous to the Sensibilities.—General sensibility becomes excessive, producing tears without cause; perception is weakened, and memory almost destroyed; distraction or absence of mind renders the judgment unfit for any operation; the imagination gives birth only to fantasies and fears without grounds; the slightest allusion to the dominating passion produces motion of the muscles of the face, the flush of shame, or a state of despair; the desires become capricious, and envy rankles in the mind, or there ensues a total disgust.

Further Horrid Consequences.—The wretched being finishes by shunning the face of men and dreading the observation of women; his character is entirely corrupted, or his mind is totally stupified. Involuntary loss of the reproductive fluid at last takes place during the daily motions; and there ensues a total exhaustion, bringing on heaviness of the head, singing in the ears, and frequent faintings, or a sensation as if ants were running from the head down the back, together with pains, convulsive tremblings and partial paralysis.

Stunted Growth.—Long previous to these severe effects, the losses which have been described arrest the increase of stature, and stop the growth of all the organs, and the development of all the functions.

Incapacity to Procreate.—An incapability of ever giving life to strong and robust children, is another effect of these losses, which precedes the total ruin of the individual.

Duty of Instructors.—Intelligent instructors will know both how to divine the bad habits of their pupils, and how to avoid all excitement of them. Much attention has recently been paid to the nature of punishments. There are few of them that should not be avoided; but to punish a child by shutting him up alone in a room, is a sad error, if there be any reason to suspect him of bad habits.

Medical Remedies.—Medical remedies, astringents, sudorifics, and so forth, are weakening and injurious in other respects; and mechanical means directly applied to the organs are likely to draw the attention, and determine the blood, to the part whence it should be diverted.

Moral Treatment.—Moral means consist of good habits previous to puberty, the influence of fear and respect, and that of the nobler feelings predominating over the baser passions. This assuredly will be more easily accomplished in well-directed private education, than in public schools.

Informing the Victim.—When conviction of the existence of this habit is acquired, it becomes necessary to speak to the subject of it mildly and rationally respecting his injurious practice. There can be no danger in placing a book or article upon the habit in the hands of children whose conduct has given rise to suspicion.

Diet.—In such cases, exciting and superabundant food is highly injurious. The diet should be chiefly or altogether vegetable, and no vinous or spirituous drinks should be permitted. The latter are indeed, of themselves, quite sufficient to produce, at any time, the worst habits; and the parent who has suffered their use, has no right to complain either of precocious puberty, or of unnatural indulgences.

Value of Employment.—As it is well known that the almost unremitting employment of his muscles diverts the laborer from this vice, while shepherds, who watch their flocks in sequestered places, have been generally accused of it, it is evident that if, in youths, the superabundance of nervous power were carried off by exercise, they would be rendered more tranquil and more attentive to instruction, and would consequently make greater progress in knowledge.

The Vice Among Girls.—The vice which has now been described in boys, appears among girls, and produces similar symptoms. In general, the victims of this depravity are announced by their aspect. The roses fade from the cheeks; the face assumes an appearance of faintness and weakness; the skin becomes rough; the eyes lose their brightness, and a livid circle surrounds them; the lips become colorless, and all the features sink down, and become disordered.

Sad Results to the Organs.—If the depravity be not arrested, general disease and local affections of the organs of reproduction ensue—acrid leucorrhea, ulcerations of the vulvo-uterine canal, falling and various diseases of the matrix, abortions, and sometimes nymphomania and furor uterinus, terminate life amidst delirium and convulsions.

Duty of Mothers.—It is evident that the victims of this depravity demand the most active vigilance of mothers if they desire to preserve either the morals or the health of their daughters. It is evident, also, that the same practices are scarcely less injurious at a more advanced age, and they should be resisted by all the moral forces both victims and parents can bring to bear on the crime.

LIVING TO ONE HUNDRED.

Diminish Work.—If one has been diligently pursuing any line of business, as he enters upon old age, let him simply diminish the number of hours of active work and intrust more to others, while he rests or rides in the open air, or stores his mind with a knowledge of the affairs of his own and other countries from the columns of his daily paper.

Select a Hill-side.—If his business is in the crowded city, with its dust and smoke and foul air, let him early select on the nearest shady hillside or by lake or sea just acres enough for a summer home, with shaded walks, shrubs and flowers and a garden of fresh vegetables and fruit, where his family may spend the hot months of summer, and to which he may flee as the evening approaches each day, and spend the night and early morning with them.

Serene Old Age.—And when old age has so far advanced that he can no longer give personal attention to business he can find no better earthly paradise than this.

Stick to the Farm.—If his business has been that of farming and he is, of course, accustomed to country air, physical labor, and the mental vigilance necessary to make his business successful, when he begins to feel the weariness of old age, let him not commit the very common mistake of surrendering all his land and taking a residence in a crowded city or a densely populated village, thereby making a total change both in habits of life and surroundings.

Take a Smaller House and Acres.—Better far for such to change from their broad acres only to a suitable residence to which is attached just land enough to support a cow, a horse, pig and chickens, with a good vegetable and fruit garden.

Fresh Air, Light Labor.—Here they would have fresh country air and merely enough of the labor to which they have been accustomed to prevent time from hanging heavily on their hands, and still to afford them abundance of leisure time for reading and acts of benevolence, together with social and religious duties.

MARRIAGE IN OLD AGE.

Disappointment in Store.—One more lesson attested by abundant observation. It is that men in actual old age who contract marriage with young or middle-aged women, expecting thereby to render their remaining years more cheerful and happy, are very generally disappointed.

Divorce in Sight.—For in a very large majority of such cases either a divorce court is resorted to in a few months or the men die early from efforts to perform all the social and family duties of early adult age.

SOLID AIR.

The modern wonders of Liquid Air have been very recently surpassed by a remarkable achievement by Prof. A. L. Metz, of Tulane University, New Orleans. In his investigations upon liquid air he succeeded in reaching a temperature sufficiently far below zero to meet a point at which liquid air became solid.

In order to further experiment with the product thus secured it was found necessary to break the tube. The little piece of frozen air, which Prof. Metz also describes as resembling a bit of frosted glass, was then subjected to several tests.

Laid upon an anvil, it was struck with a hammer; the sound given out was that which one would hear on hitting a piece of firm ice, but in the present case the hammer rebounded as if it had struck india rubber.

Any object touching the solid air would immediately freeze to it, and much valuable time was lost in disengaging the pincers when efforts were made to manipulate the strange product.

Prof. Metz is making some interesting guesses founded on his discovery. He said recently:

"The discovery of frozen air opens a wide new field for speculation, and not one of the least interesting—that of the possible presence of crystalline air particles in space. The utter cold existing in interstellar space is fully recognized, and the probability is that should any air exist it does so in the form of minute crystals, like the infinitesimal frost particles which fill the air on very cold days.

"In the open space these air particles may well serve to diffuse the solar light, a diffusion which has as yet never been satisfactorily explained.

"In the more practical uses of everyday life the solid air would seem to go far beyond the promises of liquid air, as it certainly furnishes an absence of heat far in advance of the fluid form of the medium, combined with smaller bulk and simpler transportation."

Doubtless this discovery will come, in the near future, to play an important part in external and local anesthesia, just as cocaine and liquid air have.

COMMON SALT TREATMENTS.

So convenient and efficacious has salt become as a remedial agent that not only thousands use it with great success but medical men count it as among their standards.

Apoplexy.—Salt applied moistened, or as salt water, to the head is an excellent restorative to sensibility.

Bleeding.—In frequent doses of a teaspoonful each, salt is an excellent remedy for hemorrhages of lungs and bowels and stomach.

Cholera-Morbus.—Salt water, in connection with vinegar and an astringent, such as ginger or pepper, gives pretty sure relief in this disease. The dose may be a tablespoonful two or three times in an hour.

Colic.—Half a glass of salt water, taken during first stages of attack, often serves to cure the pain. A heated salt-bag applied externally is a splendid aid to the internal treatment.

Coughs and Hiccoughs.—Salt in small quantities often allays these distressing afflictions. Taken in pinches before retiring will remove tickling in the throat and conduce to sleep.

Catarrh.—The salt remedy for catarrh is very old and much resorted to. It should be made in a mild solution of milk, one pint to a half spoonful of salt, sniffed up the nostrils and held there for a time by pressure of thumb and fingers. This should be repeated several times in succession, and then the operation should be undergone three to five times a day.

Healthy Scalp.—Salt water will effectually remove dandruff and keep the scalp clean and healthy.

Sore Throat.—A gargle of salt water frequently gives relief to a sore and inflamed throat.

Dyspepsia.—There are certain forms of dyspepsia which can be relieved by small doses of salt three or four times a day.

Diarrhœa.—Salt, vinegar and some astringent, as ginger or pepper, result in cures of this disease.

Toothache.—Dip cotton in a solution of salt water and camphor and insert it in the tooth. Relief follows as a rule.

Felon.—A poultice of salt mixed with the white of an egg makes a powerful drawing poultice for a felon.

Neuralgia.—A bag of heated salt applied to the painful part frequently results in relief.

NOBLE HEALTH THOUGHTS OF MASTER MINDS.

James Russell Lowell, M.D.—"Previous to the conceptional period more can be done for the coming child than can afterward be done in years of school or college."

John Mason Good, M.D.—"A good motherly old lady is of more value in a family of children than a physician."

B. F. Clayton, M.D.—"If some one would bring out a book of home remedies, regular grandmother remedies, he would have done something which would prove a blessing in every household."

Prof. L. A. Standish.—"If children were always born under perfect conditions and with proper physical and mental inheritance on both sides of the family for generations back; and further, if the environment was always what it should be, they would grow up inclined to do only what is right and proper."

Miss Frances Willard.—"Parents, I pray you, plead with your daughters; husbands beseech your wives; young men, beg your sweethearts, to stay the destruction of the fell destroyers of the human race—the waist belt and chest compressor."

Mrs. Harriet Beecher Stowe.—"The young are impressionable, and easily led into right ways, but are still easier driven into wrong ways. It is natural for a child to deny the truth if thereby it feels it will escape punishment."

ABORTION.

Frequency.—Who dares question the God-given privilege that children have a right to be born? Yet that there are those who are depraved enough to raise this question is abundantly proved by the testimony of physicians, the daily records of newspapers, the fulminations from pulpits, the remonstrances of philanthropists, the forebodings of philosophers.

Who Are Guilty.—If this evil were resorted to for the purpose of cloaking the results of licentiousness, and covering up the disgrace of the victim of dishonored virtue, there might, perhaps, be some faint apology for silence, but unfortunately, and with shame for the wives and mothers of our land, the statement is made that they are the chief offenders. This statement may strike strangely and harshly on the ears of many devoted wives and mothers, but to the physician, who is generally the recipient of family secrets, it is a well-known fact.

Monstrosity of the Crime.—Intentional abortion is in law, morals, and to all intents and purposes, a murder. The monstrous claim that the child has no life before the time of quickening, and that, therefore, there is no sin in its destruction, has long since been exploded. The embryo is alive and quick from the moment of conception. The crime of criminal abortion is, therefore, as heinous when committed in early pregnancy as in the more advanced growth of the fœtus.

The Dire Consequences.—The laws of all civilized countries make abortion a crime highly punishable. In some countries the criminal, and even all accessories, are visited with the death penalty. Aside from this, the maternal instinct, and regard for her own health, should prevent every resort to this character of murder. No one can estimate the amount of physical suffering that may follow it. Inflammation of the womb and kindred disorders of the generative organs are almost sure to result, and very frequently defy the most skillful treatment. Blood-poisoning may follow, productive of immediate death, or, at best, of wrecked health and life-long suffering.

Excessive Child-Bearing.—Some apologize for this crime by saying that many of the diseases of delicate women are due to excessive child-bearing. This is true. The evils of excessive child-bearing are seen not only in delicate mothers, but in the puny, short-lived, idiotic children that are apt to follow. In some women pregnancy is a nine-month torment. There are others to whom it is almost certain to prove fatal. In all such cases an increase of family is undesirable, but the remedy lies not in killing the product of conception but in taking heroic moral means, and intelligent natural precautions, to prevent the condition.

The Great Natural Law.—Conception—as a natural law—takes place at or about the time of the menstrual (monthly) flow. It may be said with some degree of certainty that from ten days after the menstrual flow until within three of four days of its return there is very little chance of conception taking place. The converse is equally true. An understanding of this natural law, and a regulation of cohabitation by its observance, will enable many to control the number of their offspring at will. Of course the husband must be willing to coöperate in this by restraining his passions. He must practice continence, self-control and a willingness to deny himself. Then there will be fewer cases of outraged nature, and more of the children will be properly conceived and healthily born.

LIQUID AIR IN MEDICINE.

Production.—The first process is to compress common air about eight hundred times; that is, eight hundred feet of common air must be made by pressure to occupy the space of one cubic foot in a tube or receptacle strong enough to hold it. This tube is then tapped into another larger one which surrounds it, and the process of tapping or exchanging from one tube to another has the effect of cooling the condensed air. The process is continued until the phenomenal temperature of 312 degrees below zero is reached, when it is found that the compressed air turns into a liquid.

Phenomena.—This temperature is so intensely cold that water introduced into the vessel containing the liquid air instantly freezes; and this even if the liquid air vessel be in close proximity to a hot fire. The baser metals and most substances, when placed in the liquid air, become brittle and break like glass. Such metals as gold, silver and copper, however, resist the powerful freezing effects of the air. Heat has the singular effect on liquid air of producing a phenomenon precisely like that witnessed in boiling water. It bubbles and spurts as water in a boiling tea kettle.

Mechanical Claims.—On the discovery of liquid air, or rather, on the perfection of the first machine (1895) for successfully making it, some scientists claimed that it could be used as a substitute for steam. But it has been found impossible, thus far, to give it this high commercial success. Moreover, expansion of it to produce power, as water produces power when it expands, only resolves it into the previous form of common air. The difference, therefore, between liquid air and common is measured by only the 800 times of space, or power, between them; whereas the difference between water and steam is measured by the 1700 times of space, or power, between them.

As a Medical Agent.—Liquid air is found to be useful in surgery. A spray of it on a diseased part deadens the sensation like cocaine, and enables minor surgical operations to be performed without pain and even without an excessive flow of blood. But the nature of the mechanism employed in its production, preservation and application prevents its employment in surgery outside of laboratories or hospitals.

Other Medical Uses.—In certain cases, where a general ice application for reducing fevers is requisite, liquid air proves effective. It may be applied by wrapping the entire body in a blanket, or other suitable cover, through which the evaporizations of liquid air are allowed to pass slowly. In the evaporation of liquid air the nitrogen and oxygen do not pass off together. The nitrogen precedes the oxygen, thus leaving a highlv oxygenized remainder, like ozone. By introducing this into the common air breathed in the sick room, great improvement has been found to come to those afflicted with consumption or chest diseases. Many interesting experiments are being made with it as a curative agent in lung diseases, and some make large claims in its favor. Though in its infancy as a medical agent, it is, like electricity, full of promises and possibilities.

EMERGENCIES.

The right thing done at the right time relieves suffering, saves lives and doctor bills. Here are remedies that every one should know about:

Abscess.—Apply a warm flaxseed or hop poultice or an ointment of oleate of mercury and morphia.

Acidity.—Give five drops dilute nitric acid before meals and three grains pepsin after meals.

Ague.—Give one grain of quinine every two or three hours and five drops Fowler's solution three times a day.

Alcoholism.—Remove the cause and give half teaspoonful of compound tincture of cinchona, with about three drops tincture nux vomica, every three hours.

Amenorrhea.—Use warm sitz baths and take five grains chloride of ammonia every three hours. See also beet-syrup cure, page 1258.

Anemia.—Sponge body morning and evening with a solution of rock salt and whiskey and give iron and quinine as tonics—four grains of reduced iron and half grain of quinine—three times a day.

Angina Pectoris.—Inhale the fumes of chloroform or ether, or nitrate of amyl tears, one broken in handkerchief and inhaled, and give one-twentieth grain of arsenic every three or four hours.

Apthæ, or Sore Mouth.—Apply a mixture of one part borax and two parts honey or solution of chlorate of potash.

Asthma.—At commencement of attack give ten grains powdered alum. Saturate blotting paper with solution of chlorate of potash and saltpetre; set fire and inhale smoke.

Bed-sores.—Apply alcohol to harden skin, or glycerine cream, rubbed over part. If skin is broken apply zinc ointment.

Bile, Deficiency of.—Give one grain of mercury and chalk (gray powder) three times a day.

Bites or Stings of Insects.—Apply strong hartshorn, which destroys the poison.

Bladder, Inflammation of.—Give a mixture of one ounce tincture cubebs, one ounce tincture buchu and two drachms sweet spirits of nitre. Half a teaspoonful in water every two or three hours.

Breath, Foul.—Take three grains of camphor three or four times a day.

Breath, Shortness of.—Give ten drops of tincture of lobelia every fifteen minutes until relieved.

Bright's Disease.—Take five drops tincture of aconite three or four times a day, with warm baths.

Bronchitis.—Encircle chest with flaxseed poultice and give three drops aconite, with ten drops sweet spirits of nitre, every two or three hours.

Bruises.—A strong tincture of cayenne pepper, with half glycerine, applied removes discoloration.

Burns.—Collodion painted over slight burns subdues inflammation, or a strong solution of baking soda applied, or a mixture of four parts of lime water and one of oil applied, quickly relieves.

Carbuncle.—Apply one part tincture belladonna with two parts glycerine, and over same apply warm poultice.

Catch in the Breath.—Cold sponging for infants waking with a catch in the breath at night.

Change of Life.—For flushings, and so forth, three grains of bromide of potash every three hours. For headache apply a mixture of two ounces of ammonia and common salt, three ounces of alcohol and thirty-two ounces of water.

Chest, Pains in.—When not from inflammation apply iodine ointment.

Chicken-pox.—Keep child in darkened room, and give nitre water as drink, and one drop of aconite every two hours for two or three days.

Chilblains.—Apply balsam of Peru ointment or iodine ointment.

Choking.—In children who choke with liquids from their birth, from one to two grains bromide of potash every two or three hours.

Cholera Infantum.—Give one-fourth grain of gray powder (mercury and chalk) every hour or two, with lime water and milk for vomiting. Warm poultice to abdomen and bowels.

Cold Feet.—Immerse the feet in cold water at bedtime and rub briskly with coarse towel and give internally five drops tincture nux vomica three times a day.

Cold, Feverish.—At commencement a warm bath will cut short the attack, remove the aching pains and relieve the hoarseness.

Cold in Head.—Take at beginning ten drops spirits of camphor every two hours and inhale spirits of ammonia, with warm bath at night.

Colic.—In that of children or infants give from one-half to two grains of carbonate of ammonia every hour or two until relieved and apply fomentations of all kinds or spirits of chloroform, two to five drops, with one or two drops of laudanum.

Colic, Painter's.—Give ten grains of alum every hour until relieved; then tablespoonful of epsom salts.

Constipation.—One-sixth grain extract belladonna at bedtime, or a suppository of two grains of the extract, any of the mineral waters, fruit before breakfast, or two or three grains of rhubarb, with a grain or two of carbonate of soda, one or two times a day.

Convulsions.—In children apply ice bag to spine and inject five grains of chloral into rectum. Place child in warm mustard bath, and then apply ice bag to spine.

Cough.—In chronic cough, ten grains of alum in teaspoonful of water and spray throat with same, or spray throat with wine of ipecac.

Croup.—A teaspoonful of alum in honey or syrup every ten or fifteen minutes, or half a teaspoonful of syrup of ipecac until free vomiting takes place. Inhale the vapor of steam. Place child in hot mustard bath, and after removal put hot flaxseed poultice around the throat and chest.

Diabetes.—Give ten or fifteen grains of citrate of potash three or four times a day.

Diarrhœa.—Give starch injection with half a teaspoonful of laudanum for adult; for child only a few drops, and one drop of the wine of ipecac every hour, especially if vomiting be present, or half a grain of gray powder (mercury and chalk) every hour or two.

Diphtheria.—A strong solution of chlorinated soda applied to throat. Ice to be sucked at commencement and continued constantly till disease declines. Solution of perchloride of iron to be applied to throat and twenty or thirty drops to be administered every two or three hours.

Dislocation.—Perfect quiet should be insisted on until the arrival of assistance, and the reduction should be effected as soon as possible, delay being justifiable only when the appliances required for the purpose are not at hand or the diagnosis uncertain. Keep part well wet with warm solution of lead water and laudanum.

Dog-bite.—Wash parts thoroughly with carbolic soap, and then apply strong, hot vinegar every five or ten minutes.

Dyspepsia.—Three grains of bismuth, with five grains of charcoal, to be taken before meals, and three grains pepsin in a little water after meals. Half teaspoonful of compound tincture cinchona, with five drops tincture of nux vomica in a little water, taken three times a day, is very beneficial.

Dizziness.—Give five drops of tincture of gelsemium four times a day.

Earache.—Apply croton oil liniment to back of ear, and drop in ear one or two drops of chloroform or two drops of laudanum, and five of sweet oil.

Eczema.—Apply a cold potato poultice, with a little powdered camphor and oxide of zinc sprinkled on, or the powder alone may be dusted over the surface, and wash parts with yolk of egg and water or milk and water.

Epilepsy.—At commencement inhalations of chloroform or ether for a few moments. Ice to spine.

Eructations, Offensive.—Five drops of dilute hydrochloric acid in a little water, with three drops of tincture nux vomica, after eating, will correct this.

Erysipelas.—Take one teaspoonful of following mixture every two hours: One ounce each of glycerine, chloroform and tincture of iron.

Erysipelas.—Give five drops tincture of aconite every hour at commencement. Add a teaspoonful of tincture of digitalis to half a pint of boiling water, and apply by means of flannels wrung out of this decoction to parts.

Eyes, Inflammation of.—Bathe the eyes three or four times a day in warm water, and then drop into each eye a few drops of the following: Boracic acid, ten grains; water, one ounce.

Faintings.—Wrap body in wet, cold sheet, allow it to remain fifteen or twenty minutes, then dry well. In threatened fainting lean forward and place the head between the legs, as low down as possible, so that the blood may gravitate to the brain. Give twenty drops aromatic spirits of ammonia every three or four hours.

Fever.—At outset give two drops tincture of aconite every hour, with nitre water as a drink—teaspoonful of sweet spirits of nitre in half glass of water. Warm mustard bath and sponging with warm water.

Flatulence.—Abstain from sugar and starchy food, also from tea. Half teaspoonful every two or three hours of the following: Teaspoonful of tincture of asafetida in half pint of water, or five grains of charcoal, with two grains carbonate soda after meals.

Fracture.—It is of great importance that any aggravation of the injury by unnecessary movements of the limb should be avoided, especially if it is of the lower limb. Patient should be placed upon a bed or lounge, a light bandage to encircle the broken limb, and two pieces of stout binders' board or wood placed on either side of limb with bandage to retain it, and perfect quiet enjoined until assistance arrives. Keep part wet with tincture of arnica.

Gall Stones.—Give ten grains of chloral every two or three hours until relieved, or tablespoonful of olive oil every two or three hours until relieved. Apply warm fomentations to seat of pain.

Glands, Enlarged.—Apply iodine ointment and give internally three grains of sulphide of calcium three times a day.

Goitre.—Apply iodine ointment two or three times a day, and give three drops tincture of belladonna every two hours for several days.

Gout.—Apply a solution to joint on cotton of five grains carbonate lithia to one ounce of water, and give teaspoonful wine of colchicum every two or three hours.

Hay Fever.—A solution of cocaine with atomizer is useful; also in the inhalation of spirits of camphor; also spraying the throat with wine of ipecac.

Heartburn.—Give five drops of the tincture of nux vomica half an hour before each meal.

Hemorrhage, Nose.—A strong solution of alum or the powder sniffed up the nostrils. Compress the facial artery of the upper jaw near the nose. Apply ice bag to spine, upper part of neck, and give one drop tincture of aconite every hour.

Hemorrhage, Lungs.—Give half a teaspoonful common salt, dry, until nausea is induced. Ice to be sucked constantly. Give five to ten drops of turpentine in sweetened water every two hours. Apply ice bag to spine, middle part of back and lower part of neck.

Hemorrhage, Stomach.—Ice to be constantly sucked. Give two drops of the tincture of witch hazel every two or three hours. Perfect rest.

Hemorrhage, After Childbirth.—Insert pieces of ice into vagina and rectum, also inject into vagina four ounces of the perchloride of iron with twelve ounces of water, and give ten drops fluid extract of ergot every two hours.

Headache.—Two drops tincture belladonna every hour or two. Hot sponge face, temples and neck. Bathe forehead with spirits of camphor and cologne. Apply mustard leaf to nape of neck, or cayenne pepper plaster. Five grains carbonate of soda every two or three hours.

Heart.—When violent and throbbing, two drops of aconite tincture every half hour until relieved. Mustard plaster over heart, also to neck. When very weak from accident, fright, loss of blood, etc., brandy and wine. Nitrate of amyl, five drops placed on handkerchief, and inhaled a few minutes. Large poultice applied to heart region. Hot applications to calves of legs and soles of feet.

Hiccough.—Teaspoonful of mustard in four ounces of boiling water, taken when cool; or three drops each tincture camphor and aqua ammonia in wineglass of water.

Incontinence of Urine, "Bed Wetting."—Ten drops tincture belladonna three times a day. The child should drink but little some hours before going to bed, and should be wakened in the middle of the night to pass water.

Itching of the Skin.—Dust parts with mixture of equal parts borax, camphor and bismuth.

Jaundice.—In attacks lasting three or four days take one-third grain of gray powder (mercury and chalk) three or four times a day for three days, then take seidlitz powder, or take twenty drops nitro-muriatic acid in wineglass of water three times a day.

Leucorrhea, Whites.—Alum, teaspoonful to pint of water as injection or teaspoonful of carbonate of soda, two ounces, tincture belladonna, water one pint, and give tincture chloride of iron, ten drops three times a day.

Lead Colic.—Bicarbonate of magnesia, fifteen to twenty grains three times a day, or iodide of potash, three grains every three hours.

Loins, Pains in.—Apply belladonna or capsicum plaster to small of back; also useful when pain is due to uterine disease or piles.

Lumbago.—A mixture of ice and salt applied to small of back, or back to be ironed, a piece of brown paper intervening. Give ten grains saltpetre every two hours, or turpentine in fifteen-drop doses every three hours. Apply poultices very hot, then cover skin with flannel and oiled silk.

Malaria.—Give one grain of quinine every three hours for several days; then, five drops of Fowler's solution three times a day for about two weeks.

Measles.—Give two drops tincture of aconite every two hours, after carbonate of ammonia three grains every three hours. Rub hands and feet with fat to remove heat and tightness produced by rash. Keep child in dark room. Warm mustard bath if rash recedes. Give nitre water as drink.

Mumps.—Keep jaws warm with poultices or fomentations, and give half grain of gray powder every two or three hours to hasten the reduction of swelling.

Nervousness.—Three grains bromide of potash every three or four hours, or elixir valerianate of ammonia, half teaspoonful every three or four hours.

Neuralgia.—Aconite or belladonna ointment applied to painful part, or a strong infusion of cayenne pepper applied on lint, or a blister to the part.

Nipples, Sore.—Alum to harden nipples, or brandy and water, and washed off before child nurses. If cracked, apply glycerine with starch, or arnica ointment.

Palpitation.—Give two grains camphor every two or three hours, or two drops aconite every hour. Place feet in hot mustard bath.

Peritonitis.—Apply turpentine stupes to abdomen. Cover abdomen with large poultice.

Pleurisy.—Apply poultices as hot as can be borne to chest and side. Keep body warm. Give two drops tincture aconite every hour.

Piles.—Apply bromide potash, one part; glycerine, five parts. Keep bowels soft, inject half a pint of water before going to stool each morning. Take about ten grains of rhubarb on going to bed.

Pneumonia.—Give two drops tincture belladonna every hour. Apply hot mustard poultice to chest, or pack the chest with cloths wrung out of ice water, and renewed every hour.

POISON OAK OR POISON IVY.

(Rhus Toxicodendron.)

Description.—It is called mercury vine in some localities. It has leaves of three leaflets, which are ovate and variously notched; its flowers are in loose, slender panicles; the smooth fruit is pale brown. The plant is so acrimonious that the touching of the leaves, or rubbing them on the skin, occasions itching, and erysipelatous inflammation and eruption.

It is found nearly all over the country, especially in moist and shady places. When bruised, it exudes a milky juice, which becomes black upon exposure to the air.

Symptoms.—The juice applied to the skin produces inflammation and vesication, and the same poisonous property is possessed by a volatile principle which escapes from the plant itself, and produces in certain persons, when they come into its vicinity, an exceedingly troublesome inflammation, particularly of the face. Itching, redness, a sense of burning, tumefaction, vesication, and ultimate desquamation, are some of the attendants of this poisonous action. The swelling of the face is sometimes so great as almost entirely to obliterate the features. Some persons coming within its influence are much more apt to be affected with the poison, and generally suffer more severely than others. With some the whole body is sometimes enormously swollen, and the patient, for many days, scarcely able to move. The effects are experienced soon after exposure, and usually begin to decline within a week.

Uses.—The leaves, when taken internally, promote the secretions of the skin and kidneys. It has been used in paralysis with marked success. It is employed by homeopathists both externally and internally in rheumatism, and as an external application in affections of the skin, and as a liniment in sprains, the stings of insects, and so forth.

Treatment.—A light, cooling diet, with saline purgatives, as seidlitz powders, rochelle salts, and so forth, with the application of cold lead-water, made in the proportion of two drachms of sugar of lead with half an ounce of laudanum, to half pint of water, and applied by means of cloths, are useful remedies. Tincture of lobelia, a saturated solution of which applied by means of linen or muslin cloths, arrests the inflammation. Our own experience with the following formulas has been most satisfactory, rarely failing to relieve the inflammation, and hastening its abatement.

ENGLISH.		LATIN.	
℞.—Precipitated carbonate of zinc	4 drachms	℞.—Zinci carb. precip.	ʒiv
Oxide of zinc	2 "	Zinci oxide	ʒij
Glycerine	2 "	Glycerinae	ʒij
Rose water	8 ounces	Aq. rosae	℥viij
Make a lotion, and apply locally.		Mft. Lotion; apply to part affected.	

ENGLISH.		LATIN.	
℞.—Resorcin	1 drachm	℞.—Resorcin	ʒj
Oxide of zinc	1 "	Zinci oxid	ʒj
Ointment of rose water	10 drachms	Ung. aq. rosae	ʒx
Apply to part affected when inflammation somewhat subsides.		Mft. Apply to affected part after inflammation somewhat subsides.	

Quinsy.—Give one drop tincture of aconite every fifteen minutes for two hours, and then every hour, and teaspoonful of tincture of cayenne pepper to half a pint of water as a gargle every two hours.

Rheumatism.—Acid steam bath relieves pain and checks perspiration. Drink freely of lemon juice. Hot applications with laudanum to joints. If fever, two or three drops of tincture of aconite every hour or two.

Ringworm.—Apply a strong solution of bluestone.

Rupture.—Place patient in hot bath to relax muscles; then on bed with legs drawn up, and kept in this position until assistance arrives.

Scarlet Fever.—One drop tincture of aconite every hour with five drops sweet spirits of nitre. Two grains carbonate of ammonia every three hours first day or two when skin is hot and red, cold effusion. Rub hands and feet with sweet oil to remove heat and tightness produced by rash, or anoint the whole body two or three times a day. Ice to be constantly sucked. If rash recedes, hot mustard bath.

Sciatica.—Apply belladonna ointment to seat of pain. Poultices applied very hot. Sulphur applied to painful part is very effective, after which the limb or part should be enveloped in flannel.

Scrofula.—Apply iodine ointment to swellings, and give ten grains of sulphide of calcium after meals, also cod-liver oil.

Scurvy.—Use vinegar and lemons freely, also fruits and vegetables. Diluted alcohol as a gargle.

Sea-sickness.—Drop doses of chloroform every fifteen minutes. Ice bag to spine and mustard to pit of stomach.

Small-pox.—Cotton wool cut in proper shapes, and dipped in lime liniment, and applied to neck and face to prevent pitting. If rash recedes apply the wet pack.

Sneezing.—In incessant sneezing with profuse running from eyes and nose, powdered camphor should be sniffed.

Sprain.—Apply the cold douche with salt added, afterward turpentine liniment.

Swimming in the Head.—Apply directly to top of head the following solution: Strong hartshorn, two ounces; common salt, two ounces; alcohol, four teaspoonfuls; water, thirty ounces; to be applied every ten or fifteen minutes with sponge until relieved.

Tetanus.—If symptoms of, from stepping on rusty nail, pin, and so forth, apply piece of fat bacon, covered with borax, to foot.

Thrush.—Use a wash composed of one part borax and two of honey, applied frequently to parts.

Toothache.—Apply two or three drops of chloroform, or oil of cloves, on cotton wool to part; rinse mouth thoroughly with hot water.

Typhoid Fever.—Aconite tincture two drops every hour, with ten drops sweet spirits of nitre.

Vomiting.—Acid of lemons. Six-grain doses of alum every hour or two. Mustard, with white of egg, applied to pit of stomach. Lime water and milk. Ice bag to pit of stomach.

FOR EMERGENCIES

ACCIDENTS.

Drowning.—Loosen the clothing; raise body by waist, letting head hang down; pull the tongue forward; raise arms above head and lower them, to induce breathing; warmth and friction to hands and feet. When breathing begins, put patient in warm bed, give warm drinks or spirits in teaspoonfuls.

Burns and Scalds.—Cover with cooking soda, and lay wet cloths over it. White of eggs and olive oil. Olive or linseed oil, plain or mixed, with chalk or whiting.

Lightning.—Dash cold water over the person.

Sunstroke.—Loosen clothing; get patient in shade; apply ice water to head.

Dog or Snake Bite.—Tie cord tightly above wound; suck the wound; cauterize with caustic, or cut away adjacent flesh with sharp knife.

Insect Stings.—Apply weak ammonia, oil, iodine, or salt water.

Fainting.—Place flat on back; cold water to face; warmth to feet.

Cinder in Eye.—Roll a strip of soft paper, like a lamp-lighter, wet the tip, and remove cinder; or draw it out with a medicine dropper.

Fire on the Clothing.—Don't run; roll on carpet, or wrap in woolen rug or blanket; keep head down to avoid inhaling flame.

Fire in Building.—Crawl on floor, cover head with a woolen wrap, wet if possible; cut holes for eyes.

Fire in Kerosene.—Don't use water; use dirt, sand or flour as an extinguisher, or smother with woolen rug, tablecloth or carpet.

Bleeding at the Nose.—Put plug of lint into each nostril, cold applications to back of neck; or snuff hot water or powdered alum up nostrils.

Bones in the Throat.—Insert forefinger and press on root of tongue to induce vomiting; or get on all fours and cough; or take an emetic—a teaspoonful of mustard to tumbler of water.

Bruises.—Use tincture of arnica, or witch-hazel.

Cuts.—If there is much bleeding tie a bandage above the cut—a handkerchief twisted by a stick makes a good bandage. All cuts should be washed out with warm water, adding one or two drops of carbolic acid; bring the edges together with strips of plaster and bind with clean bandage.

Fits or Apoplexy.—Raise the head, apply ice or cold water to it, loosen the clothing.

Lime in the Eye.—Use a lotion of sugar and water or vinegar and water.

Poisoned Wounds.—Wash thoroughly; squeeze out all blood; open and swab with carbolic acid; apply wet antiseptic dressing.

Foreign Bodies in Nose.—Give snuff to excite sneezing, or tickle the inside of the nostril with a feather.

Foreign Bodies in Eye.—Pull down the eyelid; find the object and wipe it off with the corner of a handkerchief or with the end of a toothpick, around which has been wrapped a bit of absorbent cotton.

Frost Bite.—Rub gently with snow or cloth dipped in ice water till circulation is established; wrap in cotton wool; never bring sufferer suddenly into a warm room.

Injury by Electricity.—Resort to artificial respiration as in drowning; don't use stimulants; apply cold to head, and mustard plaster to back of neck and over the heart; wrap patient in warm blankets, and give rectal injection of hot salt.

Apparent Hanging.—Cut patient down; loosen clothing and expose patient to fresh air; clean mouth and throat of mucus; pull out tongue and beat it gently; resort to artificial respiration; apply external heat and give stimulants.

Cramps.—Essence of ginger, paregoric, laudanum, hot waterbag, mustard plaster.

Sprains.—Hot water locally; laudanum and water; soap liniment later.

Dislocation.—Rest parts on pillow; apply freely warm solution of lead-water and laudanum till help arrives.

Fracture.—Place patient in bed and keep quiet; encircle limb with two pieces of wood or binding-board, bound tightly; keep parts wet with tincture of arnica till help arrives.

ANTIDOTES FOR POISONS.

Induce vomiting by tickling the throat with a finger, or drinking hot mustard water; swallow sweet oil or whites of eggs.

Acids and alkalies are antidotes to each other.

For muriatic, oxalic, acetic, sulphuric or nitric acids; use soapsuds, magnesia, lime water.

For prussic acid; ammonia and water; dash water in face.

For carbolic acid; flour and water, mucilaginous drinks.

For potash, lye, hartshorn or ammonia; give vinegar or lemon juice in water.

For arsenic, rat poison, Paris green; give milk, raw eggs, sweet oil, lime water, flour and water.

For bug poison, lead, saltpeter, corrosive sublimate, sugar of lead, or blue vitriol; give whites of eggs or milk freely.

For chloroform, chloral, ether; dash cold water on head and chest; artificial respiration; piece of ice in rectum.

For carbonate of soda, copperas or cobalt; give soapsuds and mucilaginous drinks.

For iodine, antimony, tartar emetic; give starch and water; astringent infusions; strong tea.

For mercury and its salts; give whites of eggs, milk and mucilaginous drinks.

For nitrate of silver, or lunar caustic; give salt and water.

For opium, morphine, laudanum, paregoric, soothing syrups or powders; give strong coffee; a hot bath; keep patient in motion and awake.

Strychnine or tincture of Nux Vomica; give mustard water to promote vomiting; then keep patient warm and quiet to avoid convulsive attack.

For vapor (gas) poison. Remove patient into fresh air; loosen the clothing; beat gently upon the tongue; wipe mouth and throat clean of mucus; practice artificial respiration if necessary; apply external heat and active stimulation.

For ivy poisoning. Apply cloths wet with lead water and laudanum or black wash. Oxide of zinc ointment gives relief.

For sumach; apply a paste of equal parts of starch and glycerine. Apply same for oak poison.

For match poison (phosphorus). Excite vomiting; give milk and magnesia, followed by flaxseed or slippery-elm tea.

Mushrooms (toadstools); evacuate stomach and bowels; give epsom salts; stimulate.

Tobacco; cause vomiting with salt and mustard water; stimulate.

In all cases of induced vomiting, take care that the patient's head is supported, so that the matter may be ejected at once, not drawn into the windpipe.

HOURS FOR SLEEP.

According to an eminent authority the following is the average amount of sleep required:

Under 10 years	11 hours.
Under 13 years	10½ hours.
Under 15 years	10 hours.
Under 17 years	9½ hours.
Under 19 years	9 hours.

After the age of 19, the amount must depend on the work and requirements of the individual.

HOW TO PREVENT FIRE.

Lamps should not be entirely filled before they are lighted, as the oil swells when it becomes heated. Then a glass-bodied lamp will burst.

A good oil lasts longer, gives a better light, leaves the lamps cleaner and in better condition, and has not the unpleasant smell of a cheap oil. Therefore it is the most economical as well as the safest purchase in the long run.

Matches should be kept in a biscuit-tin on a high shelf. Safety matches are as cheap as the other kind.

Put alum in the rinsing water when washing cottons, prints, muslins and flannelettes, as this lessens the danger of the material catching fire.

A bag of fine sand takes up little room in a handy corner of the cupboard, and it will put paraffin flames out. Failing this, remember the bag of flour and the hearthrug.

To rake out a fire at night is a most dangerous practice, especially if the rug is left down and there is no fireguard.

A fired chimney can be put right by sprinkling salt or flour of sulphur on the fire. In bad cases block up the fireplaces with wet sackings and old carpets.

When fire really does break out people forget all the directions learnt in calm moments, but these three little sentences left on a little card on the nursery or living-room wall may recur to the most distracted person:

1. Smoke follows a draught; shut doors and windows.
2. You can breathe through a wet handkerchief or your stocking.
3. There are twelve inches of pure air under the smoke near the ground.

HEAT REQUIRED IN COOKING.

In using the oven it is very necessary to know the proper heat that is needed and the length of time the cooking requires. Many good ranges now have an oven thermometer. Others can be so fitted at little cost.

Here is a short table giving the correct time and heat required:

	Degrees	Time in oven.
Roast Beef, raw.....	240	8 minutes per lb.
Roast Beef, well done	250	12 minutes per lb.
Bread..............	250	50 minutes per lb.
Biscuits............	275	5 minutes
Cake, fruit..........	275	2 hours
Cake, sponge........	240	45 minutes
Chicken............	245	2 hours
Duck..............	250	2½ hours
Fish................	250	40 minutes
Lamb..............	250	1½ hours
Mutton, rare........	250	8 minutes per lb.
Mutton, well done....	260	12 minutes per lb.
Pork..............	250	2½ hours
Potatoes...........	260	1¼ hours
Turkey............	240	3 hours

HOW INFANTS GROW.

The average length of new-born infants is about 19¾ inches for boys and 19 1-3 inches for girls. The height at the end of each year usually follows a certain ratio based on the height at the end of the preceding year. Thus at the end of the first year the infant should have increased in height two-fifths of its length at birth; at the end of its second year it should have added one-seventh of its previous height; at the end of the third year, one-twelfth; at the end of the fourth, one-fourteenth; at the end of the fifth, one-fifteenth; at the end of the sixth, one-eighteenth, etc.

Thus, if an infant is 20 inches in length at birth, it should measure at the end of the first year 27.65 inches; at the end of the second, 31.6 inches; at the end of the third, 34.23 inches; at the end of the fourth, 36.68 inches; at the end of the fifth, 39.125 inches; at the end of the sixth, 41.4 inches. For the next six or eight years the annual growth is about 2.2 inches a year, followed during the period of puberty by a rapid growth, after which the growth is much slower until the age of twenty-five is reached. In many cases there is a slight increase, until the age of fifty, after which the height gradually decreases.

The average weight of new-born infants is 6.735 pounds. One year after birth the average weight is about 20.2 pounds. In six years the weight has doubled. At the age of nineteen years the average weight is about the same as the weight of old age. The maximum weight of the male is usually attained at the age of forty; of the female at about forty-five. A man should weigh 28 pounds for each foot of his height; a woman, 24 pounds for each foot. Thus, a man five feet nine inches high should weigh 161 pounds. A woman five feet six inches high should weigh 132 pounds.

Waterbrash.—Give three drops of dilute hydrochloric acid before each meal.

Whooping-cough.—Two grains of alum in honey every two hours. Make an infusion of red clover blossoms—dried, two ounces—steeped in a pint of boiling water for four hours, and give a wineglassful occasionally through the day.

Worms.—Santonin, two grains; castor oil, one ounce; of this give child teaspoonful three or four times a day.

Wounds.—Carbolic acid, twenty drops; sweet oil, one ounce; apply to part affected, or apply ice and salt to prevent inflammation, or fat bacon sprinkled with baking soda.

Wounds, Clean-cut.—Clean the wound and remove clots of blood, grains of sand or dirt, and so forth, and bring edges together with strips of adhesive plaster, and apply only compresses wet with water, renewed frequently.

Wounds, Torn or Crushed.—Cleanse the wound thoroughly with warm water, and use as a dressing solution of sugar of lead, two teaspoonfuls; alcohol, three teaspoonfuls, and six ounces of water. Keep wet with this every half hour.

Wound of an Artery.—If the point from which the blood spouts can be seen, simply place the finger firmly upon it and keep it there until assistance arrives; or tie a handkerchief or bandage around the injured limb, between the injury and the body, so as to stop the circulation. Place ice upon the wound.

Wounds of the Scalp.—Sponge it to clear it of all blood or dirt, and when bleeding has ceased, bring its edges together with small strips of plaster. Apply a light pad soaked in cold water, and renew same every little while.

QUICK AND EASY METHOD OF TELLING YOUR COMPLAINT BY ITS SYMPTOMS.

Abdomen, swelling of; picking at the nose; itching about the anus; grinding of teeth in sleep—*Worms.*

Acid belching; heart-burn; nausea; water-brash; sinking at pit of stomach; sense of fullness or weight in the stomach; loss of appetite—*Dyspepsia.*

Ague cake; pain in right side under the ribs; a small lump can be felt in this region; constipated bowels; feeling of debility; headache—*Intermittent Fever.*

Alcoholism; tremors; loss of appetite; bitter eructations; headache; dropsy; pain at pit of stomach—*See Gold Cure,* page 1342.

Anasarca; swelling of the ankles and face; pitting when these are pressed upon; shortness of breath—*Dropsy.*

Anginosa scarlatina; fever; scarlet flush; second day on face, neck and throat; sore throat—*Scarlet Fever.*

Anus, prolapsus of; protrusion of the bowel; great pain and tenderness; fever; restlessness—*Prolapsus ani.*

Aphthæ; small whitish specks in mouth; headache and feverish symptoms—*Sore Mouth.*

Arsenic, poisoning by; burning in stomach and bowels; vomiting; diarrhœa; convulsions; cramps; clammy sweats—*Poisons and Antidotes.*

Aura epileptica; a peculiar sound; frothing at mouth; insensibility; convulsions—*Epilepsy.*

Back, pain in; pain in lower part of back; fever; alternate of flushes, hot and cold; pain and swelling of feet and limbs—*Rheumatism.*

Bed-wetting; debility; swelling of abdomen; circles under the eyes; slight fever—*Incontinence of Urine.*

Bilious headache; constipation; bitter taste; coated tongue; belching of gas and food—*Liver Complaint.*

Bloody flux; fever; mucous or blood passages; swelling and tenderness of bowels—*Dysentery.*

Bowels confined; irregular action of the bowels; one day costive; next relaxed; pain in side; coated tongue; headache—*Liver Complaint.*

Bowels relaxed; griping pains in stomach; sometimes twisting; coated tongue; fever; headache; tenderness of stomach—*Diarrhœa.*

Bowels (infantile) relaxed; great pain; feverishness and thirst; head hot; tenderness of abdomen—*Cholera Infantum.*

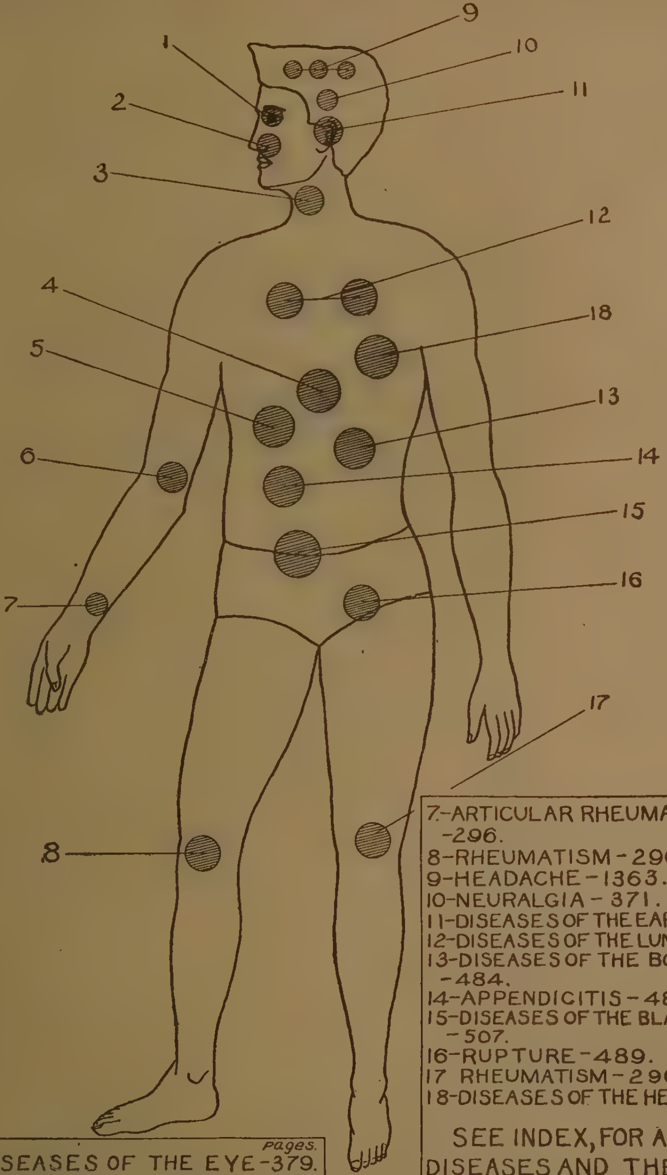
Bowels, costiveness of; vomiting; tenderness; pain; thirst; quick and high pulse—*Inflammation of Bowels.*

Bowels, burning pain of; cold, clammy skin; small, weak pulse; collapse; vomiting—*Cholera.*

Brain, affection of; headache; giddiness; intolerance of light; fever; constipation; grinding of teeth—*Meningitis.*

Breath, shortness of; breathing noisy and labored; wheezing; cough; flushed face and eyes—*Asthma.*

Breath offensive; constipation; headache; pain in head and right shoulder—*Liver Complaint.*



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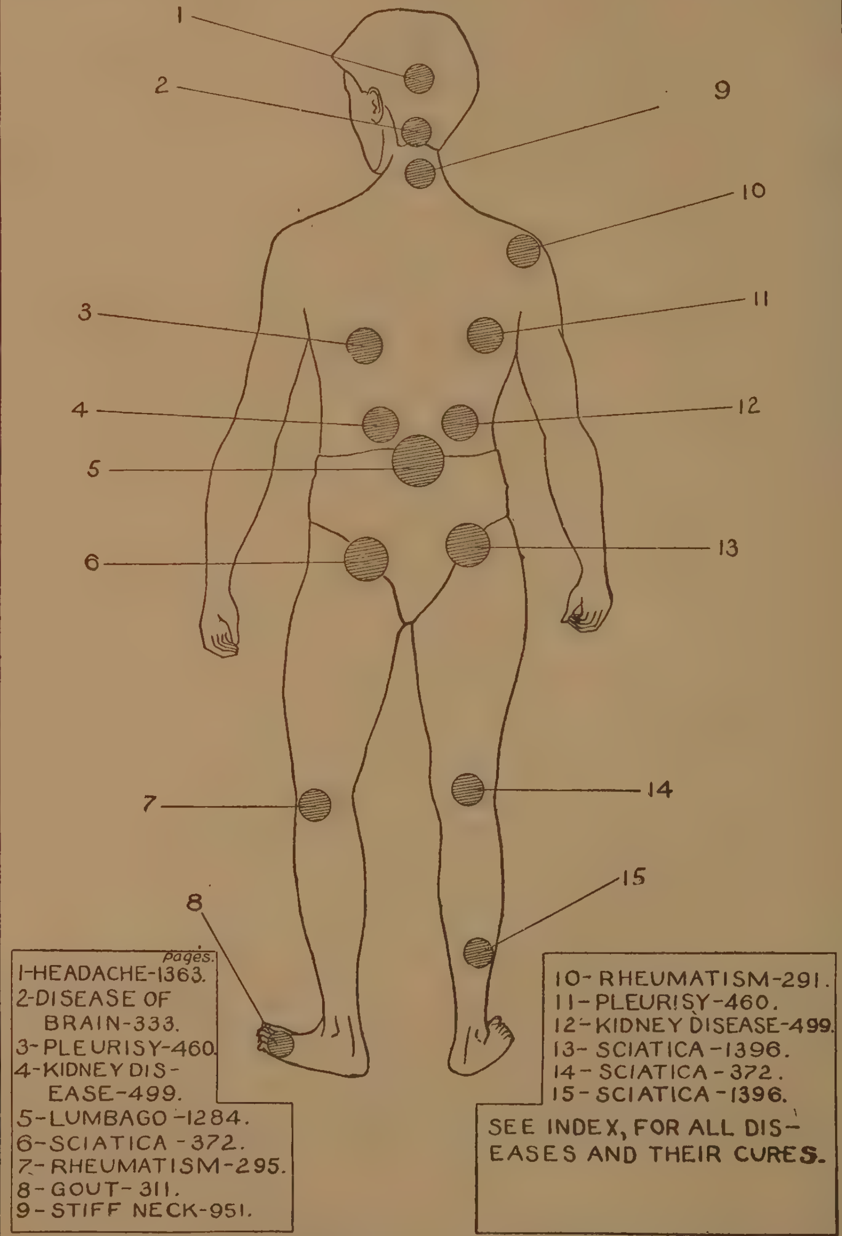

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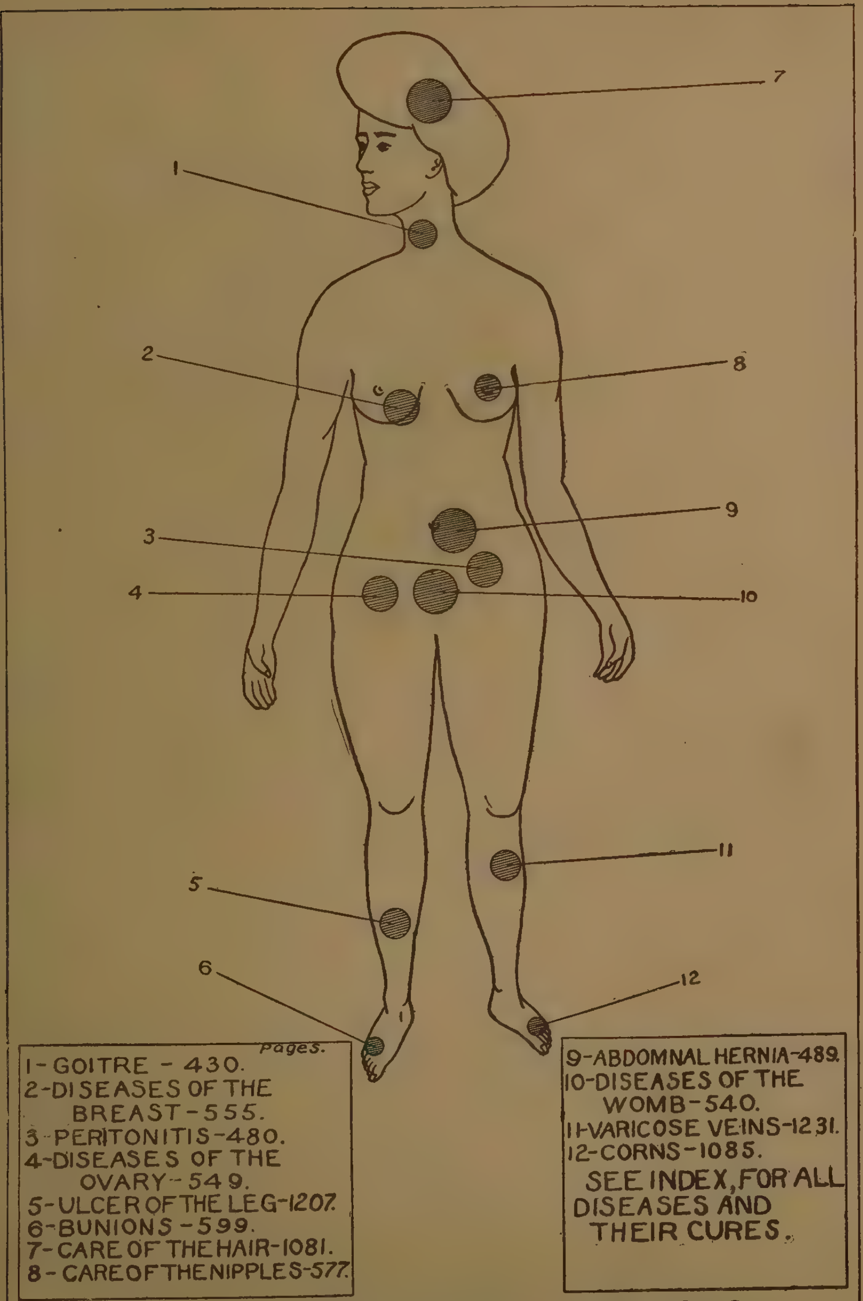

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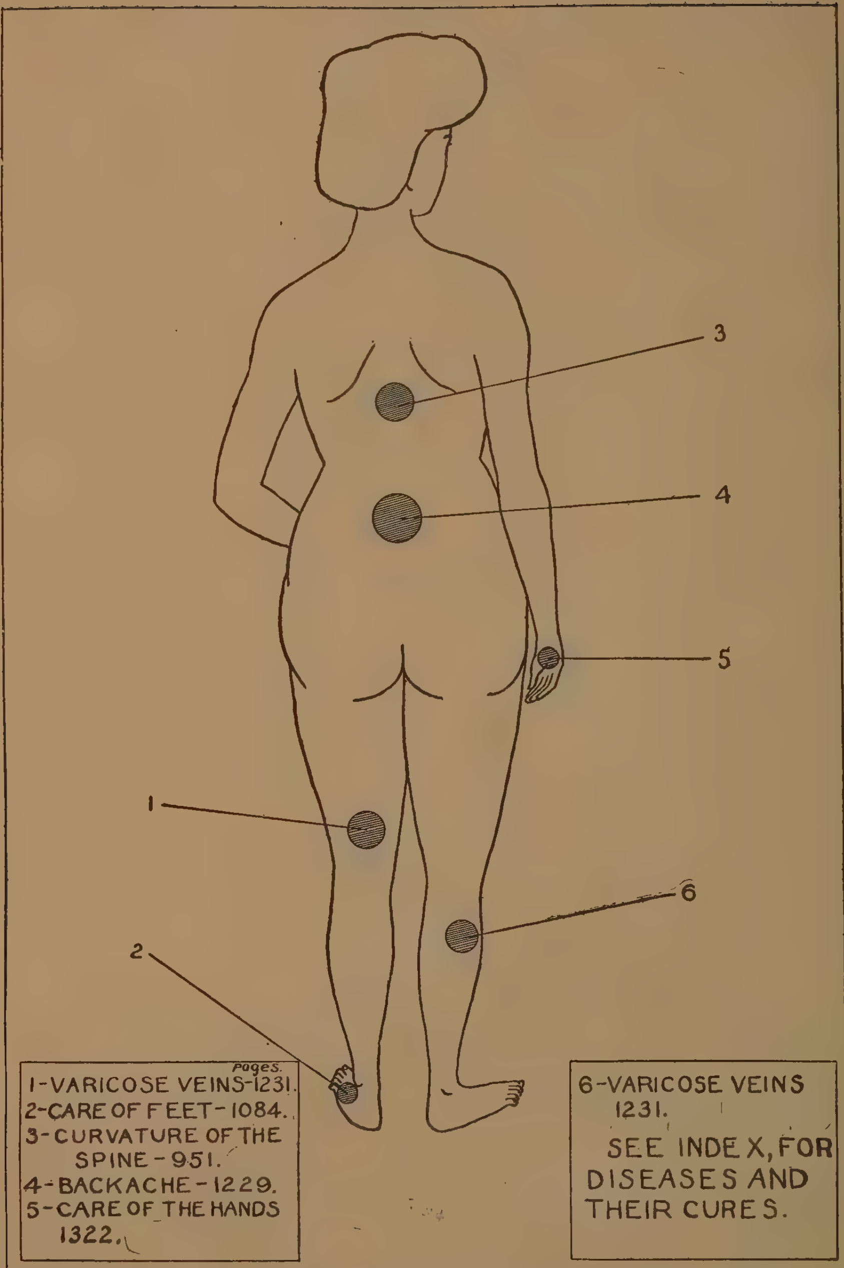
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SEE INDEX, FOR DISEASES AND THEIR CURES.

DIAGRAM DIAGNOSES OF DISEASES.

Breath, shortness of; cough; bleeding of nose; strong pulse; headache; ringing in ears; intolerance of light; palpitation; pain in chest—*Heart Disease.*

Breathing difficult; increased by movement of any kind; violent palpitation; suffocation; hard pulse—*Heart Disease.*

Breathing labored; faintness; coldness of skin; bloody passages; small, feeble pulse; thirst—*Cholera.*

Breathing oppressed; red and swollen tonsils; great pain in swallowing; fever; restlessness; dry tongue and throat—*Quinsy.*

Breathing, husky; loss of sensation and motion; hard, full pulse; flushed face—*Apoplexy.*

Chest, contraction of; short and dry cough; hectic fever; night sweats; general debility; loss of appetite; wasting constipation; swelling of limbs—*Consumption.*

Chest, distress of; shortness of breath; cough; fever; tongue coated white; vomiting; skin hot and dry; pulse full—*Bronchitis.*

Chills, followed by violent pain in abdomen, increased by the slightest pressure, even the bed-clothes; nausea; dry tongue; full, hard pulse—*Peritonitis.*

Chills, with lancinating pain on one side of the chest; dry cough; short breathing; difficulty of lying on affected side—*Pleurisy.*

Chill, followed with pain; shortness of breath; pulse quick and hard; pain, aggravated by cough—*Pneumonia.*

Chill, followed by swelling of throat and tonsils; headache; fever; pulse high; hoarseness; skin dry—*Diphtheria.*

Chill, followed by thick, ashy color of throat; vomiting; diarrhœa; great prostration; spasmodic cough—*Malignant Diphtheria.*

Chill, followed by sore throat; intense headache; pain in chest; nausea; scarlet rash in about forty-eight hours, face, neck, throat and limbs—*Scarlet Fever.*

Chill, followed by watery eyes; headache; vomiting; rash in at end of fourth day; diarrhœa; nausea—*Measles.*

Chill, followed by tongue and teeth coated with a dark, brown fur; headache; vomiting; pain at pit of stomach; clammy perspiration—*Typhus Fever.*

Chill, followed by slight prostration; pain in head and limbs; skin hot and dry; pulse rapid; temperature high—*Typhoid Fever.*

Cold limbs; headache; pain on pressure of spine; small of back; want of exertion; sleeplessness—*Spinal Disease.*

Consciousness, complete loss of; muscles are rigid and remain in any position placed; a sudden suspension of the action of the senses and of volition—*Catalepsy.*

Cough; hard, oppressed breathing; headache; vomiting; dry cough; fever; harsh skin—*Bronchitis.*

Cough, quick; hot skin; pain in shoulder blade and breast; headache; expectoration of bloody mucus; difficult breathing—*Pneumonia.*

Cough, simple, with slight pain in chest and hoarseness—*Bronchitis.*

Cough, spasmodic; pain in chest; night sweats; flush of face; emaciation; fever—*Consumption.*

Cough, irritating; pain in head, with discharge from nostrils; husky voice; fever and general debility—*Catarrh.*

Cough, with sneezing; running from nose and eyes; fever; followed by an eruption in four days—*Measles.*

Diarrhœa; violent pain at navel; bowels hot and tender to pressure; a blue line on gums—*Painters' Colic.*

Delirium at onset; coldness of body and limbs; great nausea and thirst; intense pain in head; spots on body; bleeding at touch—*Spotted Fever.*

Diarrhœa; profuse and prostrating; faintness; cold, clammy skin; vomiting; small pulse—*Cholera.*

Digestion difficult; furred tongue; great loss of appetite; night sweats; fever morning and evening; cold extremities—*Consumption.*

Delirium, with flushed face; whites of eyes and skin yellow in color; great thirst; tongue coated white; burning pain at pit of stomach; pain of limbs—*Yellow Fever.*

Dizziness, with constipation; pain in right side and shoulder; tongue coated; slight fever—*Liver Complaint.*

Ears, ringing in; violent pain in head, with redness of eyes; flushing of face; fever; constipation; delirium—*Meningitis.*

Eruptions, slightly red; not regular in shape; more or less itching; first on neck and breast, then on legs and arms; headache and slight nausea—*Chicken-pox.*

Eruption, after fourth day, similar to flea bites; sore throat; hard, dry cough; running of eyes and nose—*Measles.*

Extremities clammy; with chill; body hot; soreness of limbs; headache—*Typhoid Fever.*

Face; small, weak pulse; face livid; fever; restlessness; great pain in head—*Apoplexy.*

Face, great redness of; watery eyes; great pain in head; full, hard pulse; extreme restlessness—*Meningitis.*

Fever, in which a rash appears in about seventy-two hours, which are irregular shaped vesicles—*Chicken-pox.*

Fever, in which the rash appears in about four days, with running of the eyes and nose; fever; cough—*Measles.*

Fever, in which the rash appears as a scarlet flush on the second day; sore throat; fever; headache—*Scarlet Fever.*

Fever; sore throat; chill; dry mouth; aching limbs—*Diphtheria.*

Fever, with difficult breathing; restlessness; pain in throat; fever; full pulse—*Croup.*

Flatulence; acrid belching; loss of appetite; nausea; coated tongue; constipation; heart-burn—*Dyspepsia.*

Foot; a sharp, burning lancinating pain of heel or great toe; especially about the joint, followed by chill and some fever—*Gout.*

Giddiness, with difficult breathing; palpitation; full, hard pulse; sometimes bleeding from nose—*Heart Disease.*

Griping pain, especially in neighborhood of the navel, with vomiting and costiveness; the pain increasing at intervals—*Colic.*

Hoarseness, with difficult breathing; hard, dry cough; fever; headache—*Bronchitis.*

Hoarseness; with hot skin; hard pulse; which symptoms increase toward evening; fever—*Croup.*

Headache, with intense pain in back of neck, followed by a rash; vomiting and chill—*Cerebro-spinal Meningitis.*

Headache; with pain directly on top of head; nausea; vomiting; cold limbs; tenderness of lower portion of spine—*Spine Disease.*

Headache; vomiting; with an eruption of vesicles appearing on the third or fifth day; great pain in back and limbs; fever—*Small-pox.*

Headache; with pain in side and right shoulder; yellowishness of eyes; constipation; headache—*Liver Complaint.*

Headache; with an eruption appearing on second day; characterized by scarlet flush; sore throat; fever—*Scarlet Fever.*

Headache; with an eruption of irregular vesicles; slight fever—*Chicken-pox.*

Headache; with an inflammatory redness of skin; pain of a burning, lancinating character—*Erysipelas.*

Headache; with lassitude; fever; a slight eruption on surface of bowels—*Typhoid Fever.*

Heart-burn; griping pains; belching of gases; retching; vomiting; tenderness at pit of stomach—*Cholera Morbus.*

Head; with flushing of face; intolerance of light; quick, hard pulse; vomiting—*Meningitis.*

Heart; difficulty in breathing; pain in chest; cold and clammy perspiration—*Heart Disease.*

Heart; sharp lancinating pain in left arm and breast; oppressed breathing—*Angina Pectoris.*

Heart; feeling of suffocation; which is increased on exertion of any kind; quick pulse—*Heart Disease.*

Inflammation of any portion of body; with burning tenderness; shiny appearance; headache and nausea—*Erysipelas.*

Itching at the nose and in the neighborhood of anus; swelling of abdomen; offensive breath; grinding of teeth in sleep—*Worms.*

Itching; with small flea-bite patches; fever; constipation and slight nausea—*Shingles.*

Itching at the anus; with at times the discharge of a small quantity of blood; fullness of the parts; with pain in limbs—*Piles.*

Itching; with patches of rough, amorphous scales; skin often chappy —*Scabies or Itch.*

Joint, pain in knee or ankle; tenderness of hip and surrounding parts; fever—*Hip Disease.*

Joints—excruciating pain of the fibrous portion of the joint of great toe; headache; fever—*Gout.*

Joints—fever; swelling of joints in different portions of body; acid perspiration; pain much increased at night—*Rheumatism.*

Joints—pain, excited by the slightest touch; fever; headache; pain shifting in character—*Neuralgia.*

Kidney, with pain extending to abdomen, groin and thighs; constant desire to urinate; scalding urine; headache; fever; hard pulse—*Gravel.*

Kidney—chilliness; nausea; vomiting; pain in back and limbs; puffy face and eyelids; fever—*Bright's Disease.*

Kidney—tenderness of small of back; fever; pain of lumbar region; headache; nausea—*Kidney Disease.*

Kidney—loss of flesh; excessive urination; excessive appetite; tongue glazed and furrowed; mouth clammy; diarrhœa; failure of sexual and mental powers—*Diabetes.*

Muscles, stiffness of the jaws; rigidity of muscles; arching of the body upon the neck and heels; respiration very difficult; chewing of food impossible—*Tetanus.*

Muscles, great pain of, which is of a darting, shooting or lancinating character, without inflammation—*Neuralgia.*

Muscles, very rigid, with loss of consciousness; the limbs retain position in which they are placed—*Catalepsy.*

Muscles, slightly rigid; a morbid excitability of the whole nervous system; alternate laughing and crying—*Hysteria.*

Nausea, with vomiting; abdominal pain and tenderness, increased by movements; constipation; fever; rapid pulse; sleeplessness; collapse—*Peritonitis.*

Nausea, with vomiting of greenish matter; headache; constipation; yellow skin; hard pulse—*Liver Complaint.*

Nausea, with difficult breathing; high temperature; full pulse; headache; dark, brown tongue—*Typhoid Fever.*

Nausea, with hard abdomen; pain relieved by pressure; obstinate constipation; blue line along edge of gums—*Painters' Colic.*

Nausea, with vomiting; rejection of food; languor; debility; sometimes stupor; head hot; abdomen swollen; coldness of extremities—*Cholera Infantum.*

Nose, inflammation of; discharge of mucus, of an acrid character; running of eyes; high fever; headache; pain in limbs; full, hard pulse—*La Grippe.*

Nose, copious discharge from; sneezing; cough; tightness of chest; fever; headache; running of eyes—*Hay Fever.*

Nose, offensive discharge; pain of forehead; huskiness of voice; sore throat—*Catarrh.*

Pain in back and at lower part of abdomen; frequent desire to pass water; nausea; anxiety; cold perspiration; burning in the urethra—*Inflammation of the Bladder.*

Pain, with frequent desire to pass water, of a scanty, reddish character; constipation; headache—*Kidney Disease.*

Pain in right shoulder and side; headache; vomiting of greenish matter; nausea; coated tongue; urine scanty and high colored—*Liver Complaint.*

Pain in paroxysms; sometimes very severe; throbbing and lancinating in character, coming and going—*Neuralgia.*

Pain over lumbar region or small of back; scalding urine; frequent desire to urinate; headache; nausea; fever—*Gravel.*

Pain, with fullness and heat in nostrils; acrid discharge; sore throat; dry cough; loss of appetite; languor—*Catarrh.*

Pain and tenderness of bowels; constipation; quick pulse; thirst; high-colored urine—*Peritonitis.*

Pain of great toe and ankle; shivering, followed by fever; headache—*Gout.*

Pain of left side; suffocation; palpitation; difficulty of breathing; hard full pulse; headache—*Heart Disease.*

Pain running down arm; over heart; heart pang; clammy perspiration; coldness; headache—*Angina Pectoris.*

Pain of throat; difficulty in swallowing; tonsils inflamed; thirst; fever; headache—*Quinsy.*

Pain; with redness and swelling of joints; acid perspiration; pain increases at night; headache; fever—*Rheumatism.*

Pain in head and back; fever; furred tongue; vomiting from nine to twelve days after exposure—*Small-pox.*

Pains; griping; with straining and purging of green or yellowish matter; very offensive; great thirst; fever and headache—*Cholera Morbus.*

Pain; with cough; loss of appetite and flesh; night sweats; difficult breathing—*Consumption.*

Pain of a lancinating character; forepart of breast; thirst; difficult breathing; headache; hard pulse—*Pleurisy.*

Pain; dull in character but deep seated; cough; bloody expectorations; hot skin; great thirst; hard full pulse—*Pneumonia.*

Pain; deep seated in hip, knee and ankle; until suppuration takes place—*Hip Disease.*

Pains; similar to rheumatism; with ulcers or sores on different parts of the body—*Syphilis.*

Pain in back of neck and head; intense headache; nausea; vomiting; rapid pulse; neck becomes rigid; slight eruption on breast—*Cerebro-spinal Meningitis.*

Pain of a lancinating, gnawing, burning character; terminating in an ulcerous sore—*Cancer.*

Pain in head; coldness of skin; giddiness; weak pulse; constipation; flushed face—*Apoplexy.*

Palpitation of heart; pulsations stronger and more extensive; increased on motion; bounding pulse—*Heart Disease.*

Perspiration; clammy; nausea; oppressed breathing; tongue and teeth covered with a dark fur—*Typhus Fever.*

Pimples in small patches in different parts of the body—*Shingles.*

Pimples; small wheals with white top, surrounded by diffuse redness, excite considerable itching—*Hives.*

Respiration; cough; oppressed breathing; fever; pain in chest and throat—*Bronchitis.*

Ringing in ears; palpitation of the heart; shortness of breath; cough; bleeding from the nose—*Heart Disease.*

Side, pain in; forepart of breast and extending to shoulder blade; chill; followed by heat and thirst—*Pleurisy.*

Skin and eyes turning yellow; with hot skin; flushed face; white tongue; nausea; vomiting; burning thirst; pain in stomach—*Yellow Fever.*

Skin; hot; hoarseness increasing toward night; fever; headache; full pulse—*Croup.*

Skin, redness of; shivering and nausea; headache; fever; hard pulse—*Erysipelas.*

Skin; smooth; glossy and pitting under pressure; fever; constipation—*Dropsy.*

Skin; yellow; coated tongue; pain in right side and shoulder; headache—*Liver Complaint.*

Skin; dark red; over a bleb filled with a bloody fluid, under which a small induration is formed—*Carbuncle.*

Skin; kernels under; which thicken, inflame and discharge a thick secretion—*Scrofula.*

Skin; yellow colored; urine staining linen; whites of eyes tinged yellow; white tongue; bitter taste; fever—*Jaundice.*

Stomach, burning pain in; with great tenderness; great thirst; fever; hard full pulse; headache; whites of eyes and skin yellow in color—*Yellow Fever.*

Stomach, oppression at pit of; headache; yellow skin and eyes; constipation—*Liver Complaint.*

Stomach, burning of; chills; followed by fever; high pulse; constipation; scanty urine—*Congestive Chills.*

Sneezing; cough and difficult breathing; discharge from nostrils; headache—*Hay Fever.*

Sore throat; nausea; vomiting; headache; chills and shivering; with rash in forty-eight hours—*Scarlet Fever.*

Sore throat; fever; chill; aching of limbs; dryness of mouth and throat; high fever—*Diphtheria.*

Sore throat; rough dry cough; discharge from eyes and nose; followed on fourth day by an eruption resembling flea-bites—*Measles.*

Sores, ulcers, on various parts of the body, of a copper color, sometimes scaly—*Syphilis.*

Speech, loss of or incoherent; dizziness, followed by stertorous breathing and stupor; finally unconsciousness—*Apoplexy.*

Sleeplessness; headache; pain and tenderness upon pressure of lower part of spine; cold feet; chills and flushes—*Spinal Disease.*

Swelling of hip, knee or ankle, with severe pain, which lasts until suppuration takes place—*Hip Disease.*

Swelling of different parts of body; puffiness of lower eyelids; tenderness of small of back; high-colored urine; dry skin; quick pulse—*Bright's Disease.*

Swelling, harder than a boil, with purple-colored skin—*Carbuncle.*

Swelling of the glands, which become inflamed and discharge a yellowish, cheesy concretion—*Scrofula.*

Swelling on front of neck; causing headache; flushing, with shooting pains through the swelling—*Goitre.*

Swelling, distinguished by leaving for some time the indentation of the finger; skin smooth and glossy—*Dropsy.*

Tongue red, with small sores of a whitish color in mouth; offensive breath—*Thrush.*

Tongue white; cough; difficult breathing; pain in chest; fever; headace—*Bronchitis.*

Tongue white; pain in head, back, side and right shoulder; constipation; headache; thirst; nausea; vomiting—*Liver Complaint.*

Tongue covered with a dark-brown fur; nausea; headache; clammy perspiration—*Typhus Fever.*

Ulcer; ragged, painful edges, with discharge of an offensive matter; sometimes bloody—*Cancer.*

Ulcer; inflammation of throat; offensive breath; small pulse; difficulty in breathing—*Diphtheria.*

Urine, frequent desire to pass; burning pain at bottom of abdomen; nausea and vomiting—*Inflammation of the Bladder.*

Urine; highly colored; scanty; nausea; furred tongue; yellow skin and eyes; cough; pain in right side and shoulder—*Liver Complaint.*

Urine, yellow; staining linen; clay-colored stools; yellow tinge to skin and whites of eyes—*Jaundice.*

Urine, deep red; frequent desire to pass; scalding sensation; constipation; pain in lower part of back—*Kidney Disease.*

Urine, high colored, albuminous, causing a cloudy appearance; dropsy; headache; puffiness of eyelids; fever—*Bright's Disease.*

Vesicles, transparent, containing a thin serum, with more or less itching—*Chicken-pox.*

Vomiting, green-yellowish colored bile; griping pains; great thirst; headache—*Cholera Morbus.*

ADRENALIN CHLORIDE.

"MORE LIKE A MIRACLE THAN A MEDICINE."

NEW AND SURE CURE FOR HAY FEVER AND CATARRHS.

Uses of Adrenalin Chloride.—Adrenalin Chloride is the most powerful known astringent, hemostatic and cardiac stimulant. Its physiological activity is amazing. Its effects are prompt and practically instantaneous. The uses to which it can be put in medicine are almost unlimited. In controlling hemorrhage from the nose, stomach, bladder, urethra and uterus, it is without an equal. In the surgical treatment of diseases of the eye, ear, nose and throat, it provides a bloodless field for operation. As a stimulant to the heart, when that organ is depressed by anesthetics or otherwise, it is remarkably effective.

Cures Bronchitis and Asthma.—In the first stages of acute bronchitis no remedy is as likely to check or limit the inflammation as the inhaled spray of Adrenalin Chloride. The catarrh of bronchial asthma is perceptibly lessened by spraying a solution of Adrenalin into the larynx.

For Colds and Nose-Bleed.—In such diseases, and diphtheria and measles, in which the throat and nasal cavities are involved, applications of Adrenalin solution prove quite beneficial, and aid in limiting the local inflammatory tendencies. In tonsillar hypertrophy, or enlargement, it is an excellent plan to swab the enlarged glands regularly. Coryza (cold in the head) can be arrested in many cases if treated at the outset, after the attack has become established the regular application of the solution will hasten recovery. In quinsy the tonsils should be painted instead of sprayed, to prevent the formation of follicular abscesses. Persistent epistaxis (nose-bleed) and hemoptysis (spitting of blood) are readily controlled by this new remedy.

Importance in Nasal Work.—In nasal work it is of great use in swelling and hypertrophy of the mucous membrane and intranasal operations where a bloodless field is important. Of its value in the treatment of a stuffy nose from a cold in the head we have had the most pleasant personal experience, the relief being rapid and lasting. Patients can treat such cases themselves by steeping a bit of wool in the solution, twisting the wool on the end of a match, so that the wool projects well beyond the end of the wood, and inserting the plug gently and gradually into the nostril. The application will smart for perhaps a minute, but after that the mucous membrane will shrink, and the wool slips in quite readily.

In Hay Fever.—In hay fever Adrenalin gives most brilliant results.

The question has long been, "What will we do for the hay fever patients?" The question found answer for a certain class of patients—the leisure class, those with money and time to travel. But only the few are thus situated, and hay fever is no respecter of person or pockets. The inexorable law of necessity compels the average sufferer from hay fever to remain at the post of duty. He must fight it out there, and leave the question open, "What will we do for him?"

The Hay Fever Problem.—This problem presents itself every year. Sooner or later every physician is confronted with it. If he has solved it, the trouble has been it wouldn't stay solved. What was yesterday thought to be a happy remedy turned out to-day to be a doubtful experiment, or, at best, but a temporary relief; and so experiments were constantly leading to disappointments.

A Victory for Adrenalin.—A notable exception to the above seems to have been found in Adrenalin Chloride. It is, in my experience, almost a specific for the symptoms of hay fever, and a remedy to safely and surely restore the overdistended condition of the nasal erectile tissue. While the use of the remedy is yet so young, it may be regarded by some as premature to sound its praises too highly, but we regard it as having already passed its experimental stages, and as no longer containing seeds of disappointment. It is a fact beyond question that it in some way marvelously controls the vaso-motor nerves of the nose; that there comes about by its use a marked reduction in the size of the turbinate bodies, that there is prompt lessening of irritability and almost complete cessation of the coryza (cold) and sneezing; that the nasal obstruction disappears, natural breathing is resumed, and the condition of distress and unrest gives way to one of comfort; that the improvement in the conjunctival condition can be observed in less than forty-eight—sometimes in twenty-four—hours; and that its continued administration finally effects the much desired cure.

Application of the Remedy.—A good way to treat hay fever with Adrenalin is to spray it into the nose with a small atomizer, or it may be applied on a pledgé of cotton. One or two applications of either way daily usually afford complete relief.

Adrenalin in Dentistry.—Adrenalin Chloride is favorably used to stop hemorrhage after the extraction of teeth, or during oral operations. It is also favorably indicated as an application to spongy gums, and to control the bleeding which frequently occurs in the fitting of crowns.

Physiological Effect.—Regarding the physiological effect of Adrenalin, it controls hemorrhage from all mucous membranes, even in "bleeders." Applied locally it is one of the best hemostatics known in uterine hemorrhage. It causes contraction of the arterioles, rendering the parts it affects bloodless. Mucous membranes are blanched when it is applied. This is particularly noticeable when it is instilled into the eye; there is an almost immediate whitening of the conjunctiva. Taken internally, it increases the blood pressure and retards the pulse rate. The heart muscle is directly stimulated by it as when digitalis is taken. It may be administered in the form of spray, varying from 1-10,000 to 1-1,000 in strength. or internally in doses of from 5 to 30 minims.

ADRENALIN CHLORIDE FOR DEPRESSED HEART ACTION.

How it Acts.—The stimulant effects of Adrenalin upon the cardiac (heart) muscle is well marked. Unlike many heart stimulants, however, it does not induce a subsequent reactionary depression. While it is a prompt and reliable stimulant it is also a permanent systematic and nerve tonic. It serves to fortify the muscular and nervous systems and in this way serves to retain the heart-strength.

Study of the Heart.—To restore an affected heart to its normal condition, if possible, is to find the underlying causes and to treat them respectively according to the best means of modern medicine which are at command. When the heart is irregular, or when there is some disturbance of its rhythm at times, but we cannot find any evidence of heart disease, we designate the disturbance as a functional disorder due reflexly to some underlying constitutional disorder or organic disease. But whatever the form of disturbance Adrenalin seems to markedly tone the heart up, enabling it to perform its work much better and with greater ease. It has been known to restore heart action even after a suspension of several minutes.

Dose.—Adrenalin is most effective as a heart stimulant when given in tablet form. Five grains are administered at first, every two hours, day and night, until some giddiness or palpitation is observed. After this, the same dose may be given at longer periods—every three hours, then every six hours, and then three times daily.

Comparison of Virtues.—To my mind Adrenalin is a worthy successor of nitro-glycerine, strychnine or digitalis as a heart tonic. It gives greater tone. It does not act upon the nerve supply directly, yet gives tone to the heart muscle when needed. Unlike other heart tonics, it produces no effect on the normal heart or on a strong pulse of organic heart disease. While a small dose is effective, a large dose is not injurious. A weak pulse becomes stronger, an intermittent or irregular pulse is made regular by its use. A laboring heart with a high tension pulse is relieved and the pulse is softer after its use.

Angina Pectoris.—Attacks of angina pectoris (heart-pang) are promptly relieved by Adrenalin. In a few seconds, sometimes as few as ten, after its administration, the heart becomes regular in its action in every respect. This is also true in mitral regurgitation; the regurgitation murmur is considerably lessened in volume and less shrill, and the apex beat is more readily located. I have not seen a case in which it was administered for irregular pulse where its effects were not manifest in from five to ten minutes.

FORMALDEHYDE FOR BLOOD POISONING.

What it Is.—Formalin, or Formaldehyde, was discovered in 1890, and is now regarded as the first of antiseptics, possessing, as it does, the very highest germacidal properties. Its first rank is due to the fact that it is of absolutely neutral character, being neither acid nor alkali; wholly devoid of caustic or corrosive properties, and of toxicity (poison) to higher forms of life. The above cannot be said of any other antiseptic. If its vapors are inhaled, or even if it be swallowed, injury does not follow. Neither its vapors nor solution destroys nor blackens furniture or metallic articles.

Its Action.—In use it almost instantly penetrates rooms, flooring, crevices, carpets, clothing, in fact, every place likely to breed micro-organisms, and it promptly and surely destroys all bacteria infesting such places or things or that may be floating in the air.

Form in Use.—When used as a disinfectant Formaldehyde gas is the most powerful agent for the purpose known. It not only disinfects by killing germs, but it thoroughly deodorizes the air. Its pungent vapors may not be liked by the sick at first, but by judicious use of the generator deodorization of a sick-room can be carried on continuously, and the sick soon get used to the odor.

Value in Schools.—In schools Formaldehyde is the disinfectant par excellence, and it should be used daily to kill the germs which lead to dangerous epidemic diseases among children.

Excellence in the Home.—In the home its use is attended with the most beneficial results. The sympathy extended to neighboring families stricken with disease invites frequent visitation, and often these visitors carry away the germs of contagion and spread it wholesale. But not so if the sick-room or house be constantly disinfected with Formaldehyde gas

How to Use It.—For popular use a two and one-half per cent. Formalin solution can be prepared by adding one and one-half tablespoonfuls of Formalin to a quart of water. This will prove effective for killing most disease germs. A solution of such strength may be made to saturate a cloth, which is then hung over the night-light or stove, so that the solution will evaporate slowly, care being taken to occasionally re-dip the cloth. This is invaluable in all cases of measles, diphtheria, scarlet fever, whooping-cough and affections of the respiratory organs, such as colds, catarrhs, and so forth.

For Blood Poisoning.—A swift and sure destroyer of infusorial life, preventing various fermentations, preserving animal tissues, killing or checking the growth of all the low forms of animal and vegetable life, Formaldehyde is found to be an effective preventer and destroyer of blood poisoning, no matter what the cause, but especially in those cases where the causes are traceable to peritonitis and puerperal affections. The usual mode of treatment is an injection into the veins of, say the arm, a one pint solution, and closely observing the result before repeating the operation.

In Other Diseases.—Formaldehyde is highly recommended for consumption, influenza, and in all zymotic diseases, and is especially valuable in the prevention and treatment of small-pox. In bronchitis, where a volatile is indicated, Formalin gives almost instant relief, by inhaling the vapors of a weak solution. Formalin of the strength of a one per cent. solution is free from irritating properties, while its essential volatile constituents give it a healing and penetrating power not possessed by a purely mineral antiseptic solution.

CYSTOGEN.

A New Urinary Antiseptic and Solvent, Latest Discovery.—The latest discovery for disinfection of the urinary tract is Ammonium Formaldehyde, commercially known as Cystogen.

Bright's Disease.—Cystogen in five-grain doses, every three or four hours, exerts a very beneficial influence in Bright's Disease, by soothing the kidneys and retarding the waste of albumen.

Gonorrhœa.—In gonorrhœa, acute or chronic, Cystogen restricts the area of infection and prevents reinfection.

Gout and Rheumatism.—In these diseases Cystogen facilitates the excretion of uric acid and effects cures. Taken in five-grain doses, four times a day, it produces a clear, non-irritating urine and relieves symptoms of uric acid poisoning.

Cystitis.—In cystitis (inflammation of the bladder), due to whatever cause, Cystogen, in five-grain doses, four times daily, affords a cure.

Wetting the Bed.—This troublesome habit in children may be overcome by very small doses of Cystogen, say, from one to two grains, dissolved in water, four times a day.

Old People.—Old people who suffer untold agonies from suppurative cystitis find a sure relief in Cystogen. Turbid urine is rendered clear and non-irritating. The secret of its success lies in the fact that it prevents the decomposition of urine in the bladder, kidneys and ureters.

ACETOZONE.

A Most Remarkable Germicide, General Effects.—One of the latest additions to the Materia Medica, Acetozone is undoubtedly the most remarkable germicide ever discovered. It is apparently harmless. Its saturated aqueous solution may be taken inwardly in large quantities, and yet it is as powerful as a 1-1000 solution of bichloride of mercury. For this reason it is effective in the cure of diseases due to micro-organisms. As a general antiseptic it is superior to corrosive sublimate, hydrogen peroxide, carbolic acid, etc., in accidental or operative wounds marked by persistent pus formation.

In Typhoid.—The use of Acetozone in typhoid fever has been most encouraging. In a large number of typhoid cases treated the duration of the disease has been reduced to the normal cycle of fourteen days, the bowel complications were conspicuous by their absence, or, if present, were quickly overcome; there were no deaths and but few terminal expressions of the infection. The diet in these cases was milk, diluted with Acetozone solution. The Acetozone sterilized the intestinal canal and reduced the possibility of gaseous fermentation, thus preventing bowel distention, hemorrhages and perforation, and overcoming secondary infection by the typhoid organism.

Gonorrhœa.—In this disease an aqueous solution of Acetozone is perfectly efficacious, and for the female form a specific.

Vaginal Irritation.—In this exasperating affliction a solution of Acetozone by means of the vaginal douche is followed by the most satisfactory results, especially when the treatment is supported by the use of tampons of absorbent cotton saturated with the solution.

In Other Diseases.—Acetozone, in aqueous solutions, has been found efficacious in tonsillitis and pharyngitis, also in tuberculous infection of the intestines. The solution, and also direct application of the crystals, is excellent in purulent inflammation of the middle ear. In dentistry concentrated Acetozone finds application as a packing for the canine teeth, and as a direct application in cases of infection and necrosis or gangrene of the jaw-bone. The saturated aqueous solution of Acetozone is harmless on mucous membrane, and has been used in affections of the eye, the only inconvenience being a temporary smarting sensation.

Dosage.—The usual dose, when taken inwardly, is five grains, three times daily.

APETOL.

APPETIZER AND BLOOD PURIFIER.

Formula.—Nux-vomica, gentian, columba, quassia, prunus virginiana, pinus verticillatus, samaruba amara, spiræa tormentosa, cinchona, sumbul, aurantii cortex, sherry wine.

Whets the Appetite.—The above combination gives a new agent, called Apetol, which has power to increase the digestive secretions, and, consequently, the desire for food, almost instantly. Taken ten or fifteen minutes before a meal it gives a keen edge to the appetite and encourages the patient to continue its use.

Aids Digestion.—It stimulates secretion from the alimentary mucous membrane, promotes a flow of saliva and increases the production of gastric and intestinal juices. Its tonic effects are seen in the activity and amount of the glandular secretions of the stomach within a few minutes after a dose is taken. Not only is a greater amount of food digested, but there is absence of dyspeptic eructation, flatulency and epigastric pain. It increases the activity of the liver and conduces to a more abundant flow of its secretions.

Improved Nutrition.—As more food is taken, digested and assimilated, the blood is enriched and the nutrition of all the organs improved. It differs from the so-called stimulants in the respect that it does not call into sudden action forces already existent in the part, but *increases power by nutrition.* Its influence is permanent and is not followed by depression.

Restores Nerve Tone.—Healthy nervous function presupposes proper nutrition. Neurasthenia (nerve disease) is but a disorder of nutrition, with resulting cell-weakness and irritability. Apetol, by increasing appetite and digestive power, meets and removes the conditions which conduce to loss of nervous tone.

Menstrual and Other Pains.—For like reason Apetol is indicated for the relief of menstrual pains and after-labor pains, which are in reality attributable to nervous exhaustion. Many cases of nervous headache are similarly caused and markedly benefited by the like treatment. So with anemia, hysteria, melancholia and general pessimism.

Inebriety.—Apetol is an excellent stomachic tonic adapted to the treatment of gastric catarrh and morning vomiting of drunkards. The poor appetite, feeble digestion and nervousness which follow a sudden stopping of the drink habit may be removed by frequent doses of Apetol, which supplies the necessary nutritive pabulum.

Dosage.—The usual dosage in ordinary cases is a teaspoonful fifteen minutes before each meal.

PHENALGIN.

A NEW CURE FOR INSOMNIA.

What It Is.—Phenalgin is a coal-tar product containing ammonia in a nascent state. The ammonia is liberated on entry into the stomach, and acts as a tonic stimulant.

A Sleep Producer.—As a hypnotic (sleep producer) and anodyne Phenalgin is never followed by symptoms of depression. It at first increases the heart action, but this gradually slows down. It is rapidly eliminated, and is the safest agent within medical reach.

Neuralgia and Rheumatism.—Its employment is suggested in neuralgia and rheumatism, also for the relief of pains in the pelvic region. In cases of child-birth it relaxes the circular muscular fibres and facilitates delivery. It is efficacious in dysmenorrhea (painful menstruation), migraine and sub-orbital neuralgia.

Fevers.—In fevers with fluctuating temperatures it has proved of great value, obviating the use of other sedatives, and securing for the patient the recuperative influence of healthful sleep. In that unrest, undue apprehension and headache which frequently follow excessive use of liquor it gives relief and conduces to sleep when taken in ten-grain doses, and in nausea it controls the attack when taken in one- or two-grain doses. It may be used in all fevers where quick action is desired, or where the condition of the heart prohibits the use of other drugs. In malaria, and when combined with quinine, it shortens the life of the disease.

Dosage.—From five to twenty grains, according to the need and condition of the patient.

HYDATIDS.

DESCRIPTION AND REMEDY.

What They Are.—The term Hydatid was long applied to every encysted tumor which contained an aqueous and transparent fluid. It is not quite clear that hydatids are really entozoa (a group of worms). They have been found in various parts of the body, sometimes in the uterus, occasioning signs similar to those of pregnancy, but being sooner or lated expelled, the expulsion generally attended with more or less hemorrhage. In the womb they form a bladder-like substance filled with a yellowish fluid. Sometimes a bundle of them grow together like a bunch of grapes, some are elongated like beads, others are egg-shaped.

Size and Shape.—The echinococcus, or hydatids, the larvæ of the tenia echinococcus or tape worm, is a common hydatid or entozom in the human subject, and may exist as a microscopic object or as a cyst many inches in diameter. They are found in the lungs, liver, abdominal cavity, pelvis and, in fact, all cellular tissue of the human body, and the bodies of all vertebrate animals. These cysts, of which the measles in swine are an example, were not formerly looked upon as of an animal nature.

Infection of Sheep.—Sheep, in particular, often become the subject of disease in which these hydatids are rapidly generated. When so affected they become sickly and droopy and suffer from abdominal dropsy, or rot. Wet seasons, variable temperature and watery pasturage are the causes to which this condition of rot in sheep, and consequently hydatids, are attributed.

Remedy.—For this distemper in sheep they must be removed to dry pasturage and treated with muriate of soda. For the hydatids, diuretics are required, and a favorite is fox-glove and turpentine. Brown-heather, elecampane and colts-foot are also popular. As a tonic some of the preparations of iron should be used.

Removal of Hydatids.—Hydatids may be removed (1) by direct expulsion from the body; (2) by invigorating the relaxed habit of the body and restoring to the absorbent system its lost power; (3) by exciting the absorbents to extraordinary action when the exercise of their natural function is inadequate. To accomplish these a dry abode should be selected, a nutritive diet chosen, and some of the preparations of mercury taken to such an extent as the occasion may require. The intestinal fever induced by such disorder having been allayed, the tone of the stomach must be invigorated by some of the preparations of cinchona, as quinine, or by quassia, rhubarb, gentian or cascarilla combined either with the alkalies or sulphuric acid, according to the condition of the stomach. Preparations of iron or sulphate of zinc will be found adapted to constitutions thus affected.

Surgical Cure.—Removal of hydatids by surgery can be accomplished when their cysts do not occupy fatal parts. A free cut into the capsule generally effects a removal.

VARIOLA OR SMALL-POX.

Nature of Infections.—Many, if not all, infectious diseases are due to an impaired equilibrium in the mineral equations of the body. Let too great a loss of some of its normal constituents take place—such as phosphorus, arsenic, iodine, sulphur, etc., without a corresponding income of these elements in the food, and the tissues lose their vital resistance and are liable to become a prey to microbic diseases.

What Small-Pox Is.—Small-pox is a contagious fever, characterized by a pustular eruption having a depressed centre. The period of incubation (development) is about fourteen days.

Symptoms.—Its invasion is announced by chills followed by fever, pain in the back, nausea and vomiting. The eruption commences about the third day of the fever. First appears on the face, neck and wrists. With the appearance of the eruption there is more or less sore throat. The disease is always attended by a peculiar odor. In about eight or ten days the scales drop off, leaving either an indelible cicatrix (scar) or a purplish red mark, which fades very slowly.

Complications.—When patients recover from severe attacks, blindness from inflammation of the conjunctiva is sometimes the result. Besides inflammation of the eyes, glandular swellings and abscesses, bed sores, etc., are occasional complications. It is also sometimes complicated with a diseased condition of the blood.

Epidemic Form.—Like many other contagious diseases, it is subject to epidemic influences, and when it prevails epidemically it seems to be severer and more fatal.

WHAT TO DO IF EXPOSED TO SMALL-POX.

Vaccination.—If exposed to a case of small-pox or where contagion exists: Vaccination first prevention. If not successful first time, try second. If it does not take consider yourself immune—that is, no danger from exposure to contagion.

Other Precautions.—In visiting case or locality where same exists, use tobacco freely, smoking, or keep mouth closed and breathe through nostrils. Before returning home change clothing and expose the clothing worn to fumes of burning sulphur for three or four hours. Then hang in open air all day. Sponge body with mixture of equal parts of alcohol and water.

Treatment.—The modern treatment of infectious diseases, and which appears to be the most successful, is elimination (driving out or off). The main reliance is upon the intestinal tract, and the best agent is a saline (salty) remedy. It acts by causing a gentle stimulation without irritation. Mild cases require little except attention to hygienic measures.

Corrosive Sublimate Bath.—In severer cases the corrosive sublimate bath is the most approved treatment pursued. The method is as follows: A six-foot bath tub is placed beside the patient's bedside, filled with a fairly warm, 103° F., solution of the bichloride 1 : 10,000, and the patient placed therein, head and shoulders above the solution, remaining in the bath about ten minutes. These baths are given night and morning.

PRESCRIPTION FOR ABOVE BATH.

LATIN.	ENGLISH.
℞.—Hydrg., c. c. .... v tablets	Corrosive sublimate........... 5 tablets
Mft. Strength each tablet, 1-10,000.	Strength each tablet, 1-10,000.
Use two or three tablets for bath.	Use two or three tablets for bath.

Effects of the Bath.—By this means the pustulation and pitting are lessened, only the merest trace of the odor of the disease is observable, and the duration of the disease is shortened. After removal from the bath the patient feels much relief, but shortly after complains of a drying sensation or burning, which is obviated by anointing the patient with a mixture of carbolic acid, bismuth and olive oil.

Accessory Treatment.—The disease is attended with little danger. When it is severe attention should be early directed to supporting the strength of the patient. The diet should be as nutritious as he can bear, and, when indicated by the pulse, wine and stimulants should be freely administered. The troublesome itching, which causes great suffering, may be alleviated by the application of sweet oil, cold cream or lard; opiates may prove useful to procure sleep, and the bowels should be occasionally moved by a saline purge.

PRESCRIPTION FOR ACCESSORY TREATMENT.

LATIN.	ENGLISH.
℞.—Liq. ammon. acet........... ℥ss	Liquor acetate of ammonia.. ½ ounce
Sps. nit. dulc............... ʒij	Sweet spirits nitre......... 2 drachms
Tr. aconit root.............. gtt. xxv	Tincture aconite root....... 25 drops
Elix simplex qs. to make.... ℥ij	Simple elixir sufficient to make .... 2 ounces
Mft. A teaspoonful every two hours.	Take a teaspoonful every two hours.

Temperature and Diet.—The patient must be kept in a well-ventilated room in which the temperature is neither above nor below 65 degrees F. The diet should consist of milk, soups, and those foods which are easily digested and assimilated. The patient should have plenty of water. If the eyes become affected, the room should be darkened and a lotion dropped into the eyes—five grains boracic acid to the ounce of water.

Ecthol Treatment.—The disease was formerly treated symptomatically. This view was, until very recently, an eminently correct one, but to-day it is altogether untenable. The introduction of **Ecthol** has placed in the hands of the medical profession a weapon with which it can wage war on the morbid process. It should be given in doses of a teaspoonful every two to four hours.

To Prevent Pitting.—The application of a linen cloth saturated with **Ecthol** will effectually prevent the pitting in small-pox. The application of ointments of various kinds is also effective, occasionally, but these are not clean and readily applicable, like the **Ecthol,** on a cloth.

The Sick Room.—The room selected for the sick person should be large and well ventilated, and as far from the living and sleeping rooms of other members of the household as it is practicable to have it. Doors connecting with halls or with other rooms should be covered with sheets or cloths kept wet with a solution of **Camphenol**—eight tablespoonfuls to a pail of water.

All discharges from the bowels should be received in vessels containing a quart of disinfecting solution, made by dissolving four tablespoonfuls of **Camphenol** in one quart of water.

Danger of Cold.—In all cases of small-pox it is well to bear in mind that these patients should not be allowed to go out and contract cold, as is the case when a patient insists on taking up his usual avocations before he has fully regained his former standard of health. A little indiscretion means often the oncoming of pneumonia, the establishment of chronic bronchitis and disease products which may result in invalidism.

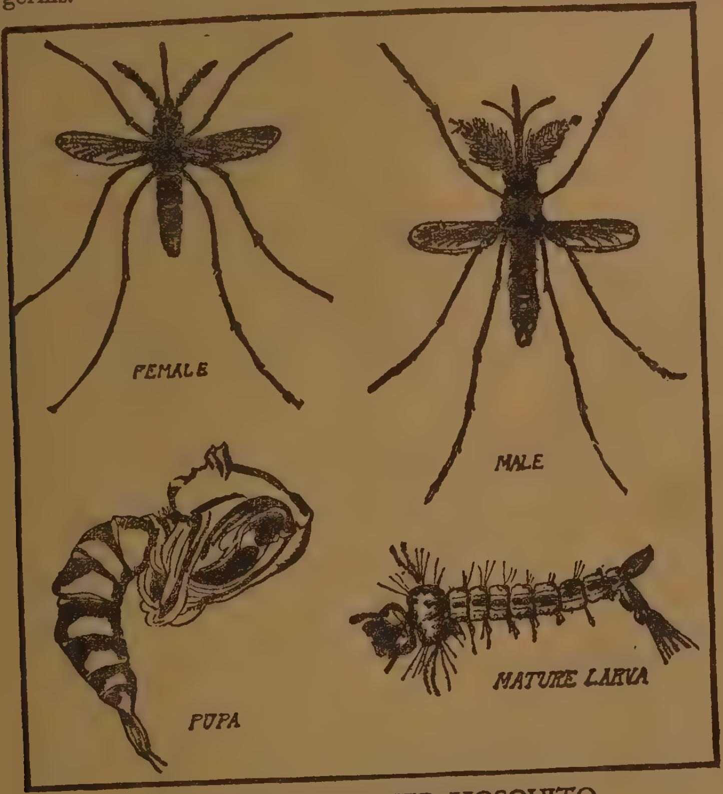
The Bath.—For those who have charge of the small-pox patient, as well as those exposed in the house, a bath should be given at least twice a week in 2½ per cent. solution of formaldehyde, and their clothing sprayed with a 10 per cent. formalin solution.

Killing Germs.—Health departments all over the country have almost unanimously concluded that formaldehyde is the most destructive agent to germ life available for house disinfection. It has no odor itself and does not attack metals, and in these respects presents great advantages.

On leaving the room the clothing should be changed, the hands carefully disinfected, and the person should remain for some time in the air.

Yellow Fever in Modern Medicine.

Yellow Fever, sometimes called Sailor's Fever, or Bilious Malignant Fever, is an acute, infectious disease of three stages, transmitted by the Stegomyia Fasciati species of mosquito, with a natural craving for fever-impregnated blood, and which bites a yellow fever victim and absorbs the fever germs.



THE YELLOW FEVER MOSQUITO

These germs, in the course of ten to fourteen days, undergo a process of development and multiplication. At the end of the period of development the germs migrate to the biting organ of the mosquito, from where they are transmitted into the blood of a healthy person through the skin, when bitten. Each germ, in turn, when deposited in the blood vessel of the human body, multiplies and develops, and, liberating its toxin, spreads through the circulation and produces the yellow fever in its most pronounced form.

If the patient, while in this condition, is bitten by a mosquito, the germs will be absorbed and in turn numerous other healthy subjects may become impregnated.

This theory of the spread of yellow fever has been demonstrated time and again by numerous medical investigators. Dr. Carrol, in Havana, several years ago demonstrated without a doubt that the fever was transmitted from one patient to another in the manner described above; so the way to eradicate the disease is to destroy the cause, viz., the mosquito.

First Stage:—The Febrile begins gradually with headache, muscular pains and general debility, or suddenly with a chill and high fever, which, in a few hours, may reach from 104° to 106°, or more, high pulse, flushed countenance, and at the end of 24 hours a scarlet rash appears on the chest and neck, and gradually extends over the entire body. The eruption is not raised. The tongue is heavily coated with a thick, whitish fur, stomach irritable, great nervousness and frequently delirium, diarrhœa common.

Second Stage:—Temperature declines, and there is marked improvement of the patient, eruption fades, and on the fifth or eighth day desquamation (scaling of the scarf-skin) takes place, stomach less irritable and the pains disappear.

Third Stage:—The fever remission disappears and the temperature again rises, strength rapidly declines and the pulse is weak. The color of the skin darkens, the nose bleeds and the black vomit takes place. When the case takes a favorable turn during this stage the temperature declines, the vomiting stops, the patient can retain nourishment and a very gradual convalescence takes place.

Treatment:—There is no specific; the treatment is symptomatic. Isolation, disinfection, cooling drinks, light nourishment, quinine and sponging for the fever; for the irritable stomach, lime water and calomel. Free stimulation should be resorted to from the start. Arsenic in the form of Fowler's Solution, in 3 minims dose, 3 times a day, or Triturates of Arsenious Acid, $\frac{1}{20}$ gr. 3 times a day, is said to be a preventative.

What gives special value to these observations and notes of the treatment of yellow fever is the fact that they are the results of the experience gained in stamping out the disease as it prevailed in epidemic form in New Orleans and adjacent places in the summer and autumn of 1905, when the best modern medical science, National, State and local, was called into requisition with a success never before reached in this country.

For the habits of mosquitoes and the best means of destroying their germs, see "Rules Advised by General Wood," p. 1378 of Medicology. General Wood, by rigid application of the mosquito theory, succeeded in ridding Havana entirely of the plague of yellow fever.

GLOSSARY.

N. B.—For Terms not given here consult the Index to this Volume and the larger Dictionaries.

Abdomen. The belly.
Ablution. Washing.
Abnormal. Unnatural.
Abortion. The expulsion of a child from the womb before it is fully developed.
Abscess. A pus cavity.
Absorbent. A medicine which takes up acidity from the bowels and stomach.
Acidity. Sourness.
Acrid. Bitter, pungent.
Acute. Severe and sudden (of a disease).
Adhesive. Sticking, uniting.
Adjuvant. A medicine added to a prescription to assist the action of the other medicines.
Adult. A person of full growth.
Affection. Disease, sickness.
Affusion. The action of pouring a liquid upon any body.
Aliment. Food, nourishment.
Alimentary. Capable of affording nourishment.
Alkali. A substance, like soda, which can destroy acidity.
Alluvial. Belonging to soil formed by deposits of mud, etc.
Alterative. A medicine which effects a beneficial change in the system.
Alveole. A tooth-socket.
Alvine. Relating to the intestines.
Amputation. The operation of cutting off a limb or part of a limb.
Amylaceous. Containing starch.
Anemia. Privation of blood.
Anesthesia. Privation of sensation.
Anesthetic. A medicine that deprives of sensation.
Analysis. The resolving of anything into its component parts.
Anastomosis. Communication between two vessels.
Anodyne. A medicine which relieves pain.
Antacid. A medicine which counteracts acidity.
Antaphrodisiac. A medicine which cools the animal passions.
Anthelmintic. A medicine or other remedy for worms.
Antibilious. That which counteracts biliousness.
Antidote. A remedy which counteracts the effects of poisons.
Antimorbific. That which opposes disease.
Antiperiodic. A remedy for periodical disease.
Antiscorbutic. A remedy for scurvy.
Antiseptic. That which resists putrefaction.
Antispasmodic. A remedy for spasms.
Antisyphilitic. A remedy for syphilis.
Aperient. A medicine which opens the bowels gently.
Aphthous. Pertaining to sore mouth.
Apnea. Absence of breathing.
Apparatus. A set of implements for some special use.
Areola. The colored circle surrounding the nipple or surrounding sores.
Aroma. Intense perfume, odor.
Arthritic. Relating to inflammation of the joints.
Articulated. Jointed.
Asphyxia. Suspended animation.
Aspirate. To breathe roughly.
Assimilation. The act of taking proper nutriment from food into the system.
Asthmatic. Subject to asthma.
Asthenia. Weakness.
Astringent. Contracting, counteracting looseness.
Atrophy. A wasting of strength and flesh.
Auditory. Relating to hearing.
Auricle. 1. The outer ear. 2. A cavity of the heart.
Auscultation. Listening to the sounds in the chest to detect symptoms of disease.
Autopsy. Examination of a corpse.
Axillary. Relating to the arm-pit.

Balsamic. A medicine for healing.
Bifurcation. Branching into two.
Bile. The fluid secreted by the liver.
Bilious. Having an excess of bile.
Bronchia. A branch of the windpipe.
Bursa. A sac.

Cachexia. A bad condition of the system.
Cacum. The blind gut.
Calcareous. Containing lime.
Calisthenics. Light gymnastics.
Calculus. A concretion in the excretory organs, as a stone in the bladder.
Callus. The hard matter formed about the fractures of bones.
Canthrus. The corner of the eye.
Capillary. Hair-like; used especially of the small veins.
Capsule. A gelatinous case for enclosing a dose of unpleasant medicine.
Cardiac. Relating to the heart.
Carminative. A medicine which expels the wind from the bowels.
Carpus. The wrist.
Cartilage. Gristle.

Catalysis. Paralysis.
Catamenia. The monthly courses of women.
Cataplasm. A poultice.
Catarrh. Unnatural discharge from a mucous membrane.
Cathartic. A medicine which opens the bowels freely.
Catheter. A hollow tube for drawing off the urine.
Caustic. A substance which burns living tissues.
Cauterize. To apply caustic.
Cellular. Composed of cells.
Cerebellum. The lower part of the brain.
Cerebrum. The upper part of the brain.
Cerumen. A wax-like secretion as the wax of the ear.
Cervical. Pertaining to the neck.
Cervix. A neck, or the neck.
Cesspool. A privy.
Chalybeate. Containing iron.
Chancre. The sore of syphilis.
Cholagogue. A medicine which increases the flow of bile.
Choleric. Pertaining to bile.
Chronic Disease. A protracted, slow disease.
Chyle. The liquid formed from food by digestion.
Chyme. The pulp formed from food by the gastric juice.
Cicatrix. The scar from a wound.
Climacteric. Puberty and change of life are the climacteric periods.
Clinical. Pertaining to the bed.
Clonic. Irregular, convulsive.
Clyster. An enema, an injection.
Coagulate. To change from a liquid to a denser state.
Coalesce. To adhere.
Collapse. Complete breaking down.
Colliquative. Dissolving, applied to sweats and discharges which exhaust the system.
Collyrium. A medicine applied to the eye.
Colon. A portion of the large intestine.
Coma. A condition of profound sleep.
Comatose. In a state of coma.
Combustion. Burning.
Concretion. A hardened mass made up of gathered particles.
Condiment. An article used to make food more savory.
Condyle. A prominence of the joints.
Congenital. Born with a person.
Congestion. Accumulation of blood in a part.
Conjunctiva. A mucous membrane of the eye.
Constipation. Insufficient expulsion of the excrement.
Constriction. A narrowing or contraction.
Contagion. A disease caught by contact.
Contamination. Pollution.
Contusion. A bruise.
Convalescence. Condition of recovery after a sickness.
Convoluted. Rolled one part on another.
Cordial. A strengthening, inspiriting medicine.
Coriaceous. Leather-like, elastic and tough.
Corrective. A substance added to a medicine to modify its action.
Corroborant. A tonic.
Corrosive. A substance which disintegrates living tissue.
Cosmetics. Substances used to beautify the complexion.
Costiveness. Same as constipation.
Counter-irritant. A medicine which relieves irritation in one organ by increasing it in another.
Cranium. The skull.
Crassamentum. The thick part of the blood.
Crepitas. Abrupt, harsh sound.
Crisis. The turning point of a disease.
Cutaneous. Pertaining to the skin.
Cyst. A sac or pouch.

Decoction. A medicine made by boiling some substance in water.
Decomposition. Decay.
Dejection. A fecal discharge.
Delirium. A wandering of the mind.
Demulcent. A medicine which removes the pain of wounded or diseased parts.
Dentition. Teething.
Deobstruent. A medicine which removes obstructions from the passages of the body.
Deplete. To empty.
Depuration. Cleansing from impurities.
Desiccate. To become dry.
Desquamation. Scaling.
Detergent. A medicine that cleanses wounds, etc.
Determination. Strong direction toward some point.
Diagnosis. The distinguishing of one disease from another.
Diaphragm. The muscular partition between the thorax and the cavity of the abdomen.
Diathesis. Natural disposition of the system.
Dilatation. The act of dilating.
Diluent. A liquid used to dilute and weaken a medicine.
Discutient. A remedy for resolving or forcing back swellings.
Disinfectant. A substance which destroys the germs of disease in the air.
Dislocation. Throwing out of the natural position.
Distention. A stretching and expanding.
Distillation. The process of converting a fluid to a vapor, and then reducing it again to its first form.
Diuresis. Excretion of the urine.
Diuretic. A medicine which promotes the flow of urine.
Domestic. Belonging to the home.
Dorsal. Pertaining to the back.
Drastic. A medicine which acts powerfully.
Duodenum. The first of the small intestines.
Dyspnea. Difficulty of breathing.
Dysuria. Difficulty in evacuating the urine.

Ecstasy. Excessive excitement; loss of mental control.
Edema. A swelling filled with fluid.
Effete. Worn out, exhausted.
Effluvia. Invisible exhalations from bodies.
Efflux. A flowing out.
Effusion. The escape or the secretion of fluids.
Electuary. A medicine whose ingredients are mixed with a syrup.
Eliminate. To strike out, to throw out.
Emaciation. The state of being thin and weak.
Emesis. Vomiting.

Emetic. A medicine which causes vomiting.
Emmenagogue. A medicine which promotes the menstrual flow.
Emollient. An external application to allay irritation.
Emphysema. A swelling produced by air in the tissues.
Empirical. Depending upon experiment, wanting in science.
Empyema. A collection of blood, pus, etc.
Emulsion. A milk mixture containing oil, water and mucilage.
Endemic. A disease peculiar to a people or nation.
Endermically. Through the skin.
Enema. An injection.
Engorgement. Overfullness or obstruction of a vessel.
Enteric. Belonging to the intestines.
Ephemera. A fever of one day's continuance.
Epidemic. Prevalent among the people.
Epidermis. The outer skin.
Epigastrium. The upper part of the abdomen.
Epiglottis. The membrane covering the gullet.
Epispastic. An external application to the skin.
Epistaxis. Bleeding from the nose.
Epithelium. The layer of cells which covers many of the membranes.
Erosion. An eating or wearing away.
Eructation. The act of belching.
Eruption. A disease of the skin.
Erysipelatous. Pertaining to erysipelas.
Erythematic. Causing a morbid redness of the skin.
Eschar. A dry slough or scurf.
Esophagus. The gullet.
Etiology. The branch of medicine which treats of the causes of disease.
Eustachian Tube. The inner channel of the ear.
Evacuant. A medicine which promotes evacuations of the bowels.
Evacuation. Movement of the bowels.
Exacerbation. A periodical increase of violence in a disease.
Excitant. A medicine which arouses the vital activity of the body.
Excoriated. Galled, abraded.
Excrement. Matter ejected from the bowels.
Excrescence. An unnatural appendage, as a wart or bunion.
Excretion. Excrement.
Exfoliation. The scaling off of a bone.
Exhalation. That which is breathed out; that which rises as a vapor.
Expectorate. To spit or cough out from the bronchial apparatus.
Expectorant. A medicine which promotes discharges from the throat or lungs.
Expiration. A breathing out.
Extravasation. The act of forcing a fluid out of its proper vessels.
Extremities. Used to designate the hands and feet.
Exudation. Sweating, a discharge of moisture.

Feces. Excrement.
Feculent. Pertaining to feces.
Farinaceous. Containing or composed of flour.
Fascia. The thin covering of the muscles.
Fauces. The back part of the mouth.
Faucet. A fixture for drawing liquor from a vessel.
Febrifuge. A remedy for fever.
Febrile. Pertaining to fever.
Ferruginous. Containing or made of iron.
Fetid. Having an offensive smell.
Fetor. An offensive smell.
Fibrine. An elastic, whitish, tough substance found in organic matter.
Filtration. The act of passing through a filter.
Fistula. A deep, narrow, chronic abscess.
Flaccid. Lax, soft, flabby.
Flashing-Point. The temperature at which gas from an oil will ignite if brought in contact with a flame.
Flatulence. The state of having wind on the stomach.
Flatus. Wind generated in the stomach.
Flocculent. Adhering in flakes.
Fetus. The young in the womb.
Flushing. Cleansing by a sudden rush of water.
Flux. Flow.
Follicle. A gland, a cavity.
Fomentation. A warm lotion applied to ease pain.
Foramen. A little opening, a perforation.
Forceps. A two-bladed instrument for grasping objects firmly.
Formication. A creeping sensation.
Function. Office, duty.
Fundament. The anus.
Fungus. A spongy, morbid growth.
Fungous. Pertaining to a fungus.

Gargle. A liquid preparation for washing the throat.
Gastric. Belonging to the stomach.
Gelatinous. Like or containing gelatine.
Genitals. The organs of generation.
Gestation. Carrying the child in the womb.
Gland. A cell or collection of cells which secrete some fluid from the blood.
Glandular. Pertaining to the glands.
Glottis. The upper part of the windpipe.
Glutinous. Resembling or containing glue.
Granular. Consisting of or resembling grains.

Hallucination. A mental disorder in which one thinks he perceives objects which do not exist.
Hectic. The fever of advanced disease.
Hemorrhage. Discharge of blood from the blood-vessels.
Hepatic. Pertaining to the liver.
Hereditary. Handed down from one's parents.
Hernia. Protrusion of the viscera.
Hydragogue. A medicine causing watery evacuations.
Hydrothorax. Dropsy in the chest.
Hygiene. That branch of medical science which treats of the preservation of health.
Hymen. The membrane which covers the mouth of the vagina.
Hyperesthesia. A state of exalted sensibility of a part of the body.
Hypertrophy. An unusual bulk of some organ.
Hypnotic. Having the quality of producing sleep.
Hypodermic. Under the skin.
Hypogastrium. The lower part of the abdomen.

Ichor. A thin watery humor.
Idiopathic. A peculiar individual affection.

Idiosyncrasy. A peculiarity of constitution.
Illuminant. That which affords light.
Impotence. Want of power.
Impurity. That which is impure, foul matter.
Inanition. Emptiness, exhaustion from want of food.
Incontinence. Want of self-restraint.
Incubation. The maturing of a contagious poison.
Incubus. The nightmare.
Indigenous. Native, produced naturally in a country.
Induration. The act of hardening.
Infection. The communication of disease.
Inflammation. Redness and swelling of a part.
Inflate. To distent, to swell up.
Infusion. Extraction of properties by steeping.
Inguinal. Pertaining to the groin.
Inhalation. The act of drawing into the lungs.
Inhale. To draw into the lungs.
Injection. Throwing a liquid into a cavity of the body by means of a syringe.
Inoculation. Communication of a disease to a healthy person by inserting contagious matter under the skin.
Insomnia. Sleeplessness.
Inspiration. Breathing in.
Inspissation. The act of rendering a fluid substance thicker by evaporation.
Integument. A covering, as the skin.
Intercostal. Between the ribs.
Intermittent. Ceasing at intervals.
Intra. Within.
Intussusception. The slipping down of one part of a tube into another.
Irrigate. To wash out.

Labia. The lips.
Lactation. Milking.
Lachrymal. Pertaining to or secreting tears.
Lacteals. Absorbent vessels conveying chyle.
Larva. An insect in its earliest form after leaving the egg.
Laryngoscope. An instrument for viewing the larynx.
Laryngotomy. The operation of cutting the larynx.
Larynx. The upper part of the windpipe.
Lateral. Sidewise.
Laxative. A medicine which loosens the bowels.
Lesion. A hurt or injury.
Lethargy. Drowsiness, heaviness.
Lienteric. Pertaining to a special form of diarrhœa.
Ligament. The strong substance binding together the bones.
Ligature. A cord for tying blood-vessels.
Linctus. A soothing cough medicine.
Liniment. A soft ointment for bathing bruises, etc.
Lithontriptic. A medicine which destroys the stone in the bladder.
Lithotomy. The cutting operation for stone in the bladder.
Lithotrity. The crushing operation for stone in the bladder.
Lobe. A round, projecting part of an organ.
Lochia. The evacuations from womb and vagina following childbirth.
Lumbar. Pertaining to the loins.
Lymph. A colorless fluid in animal bodies.

Macerate. To steep almost to solution.
Malarial. Pertaining to malaria.
Malleolus. A projection of the ankle-bone.
Mamma. The female breast.
Mania. Violent derangement of the mind.
Matrix. The womb.
Maxilla. The jaw-bone.
Meatus. A wide natural passage.
Meconium. The first evacuations of an infant.
Membrane. A thin extended, transparent tissue.
Meninges. The three membranes that envelop the brain.
Menses. The monthly flow of females.
Menstrual. Pertaining to the menses.
Metastasis. The sudden removal of disease from one part to another.
Micturition. The act of making water.
Miasm. Infection floating in the air.
Midwife. A woman who serves at a childbirth.
Minim. A drop.
Minimum. The least.
Mitral Valves. The valves of the heart.
Morbid. Not sound and healthful.
Morbific. Causing disease.
Mortification. Decay.
Mucous Membrane. The membrane lining all the cavities of the body which open externally.
Mucus. A viscid fluid secreted by the mucous membrane.

Narcotic. A medicine which relieves pain and produces sleep.
Nausea. Inclination to vomit.
Nauseant. A medicine which produces nausea.
Necrosis. Decay, especially of the bone.
Nephritic. Pertaining to the kidneys.
Nervine. A medicine which soothes nervous excitement.
Nevus. A birthmark.
Node. A knot or protuberance.
Normal. Healthy, natural.
Nostalgia. Homesickness.
Nostrum. A quack or patent medicine.
Nutritive. Nourishing.

Obesity. Stoutness.
Obstetrics. The science of midwifery.
Occipital. Pertaining to the back of the head.
Olfactory. An organ of smelling.
Ophthalmoscope. An instrument for examining the eye.
Opiates. Narcotic medicines containing opium.
Optic. Pertaining to the eye.
Orthopnea. A disease in which a person can breathe only when sitting up.
Ossification. Turning into bone.
Otoscope. An instrument for examining the ear.
Ovary. The organ of the female which forms the eggs.
Ovariotomy. The surgical operation for ovarian disease.
Ovum. An egg.

Palatableness. Degree of pleasantness to the taste.
Palliative. A medicine which mitigates pain.

Palpitation. Violent and irregular beating of the heart.
Panacea. A cure-all.
Panada. A soft, nourishing food.
Pancreas. A gland of the abdomen.
Pappillæ. The minute elevations on the surface of the skin.
Paralysis. The impairment of the function of an organ.
Parasite. An animal or plant which lives upon another.
Parotid Glands. The glands of the cheeks which secrete the saliva.
Paroxysm. A spasmodic convulsion.
Patella. The knee-pan.
Pathognomonic. Characteristic of a disease.
Pathology. The science of the knowledge of diseases.
Parturient. Bringing forth young.
Pectoral. Pertaining to the chest.
Pediculus (plural, Pediculi). A louse.
Percussion. Judging of the conditions of internal organs by tapping upon the surface of the body.
Perflation. The act of blowing through.
Pericardium. The membranous sac which encloses the heart.
Perineum. The space between the anus and genitals.
Periodicity. The state of having regular periods of change.
Periosteum. The fibrous membrane covering the bone.
Peristaltic. Contracting in successive circles.
Peritoneum. The thin membrane covering the whole internal surface of the abdomen.
Permeate. To pass through the pores of a substance.
Permeable. That may be permeated.
Perspiration. Sweat.
Petechiæ. Purple spots on the skin.
Pharynx. The cavity at the base of the skull.
Phlebotomy. The letting of blood.
Phlegmon. Inflammation of the cellular tissues.
Phthisical. Pertaining to phthisis.
Physiognomy. The face or countenance.
Physiology. The science of the organs and their functions.
Plethora. The state of being over-full.
Pleura. The membrane which covers the lungs.
Plexus. Any network of vessels, nerves or fibres.
Polypus. A tumor with a narrow base.
Portable. That may be carried.
Post-mortem. After death.
Potable. Drinkable.
Pregnancy. The condition of being with child.
Premonitory. Giving warning beforehand.
Probe. To examine a wound or sore by piercing it with a sharp instrument.
Process. Any protuberance or eminence.
Prognosis. The act of foretelling the course and end of a disease.
Prolapsus. The falling forward or downward of a part.
Prophylactic. A medicine which protects against disease.
Pruritus. Itching.
Pseudo. False.
Ptyalism. A morbid secretion of saliva.
Puberty. The age at which persons are capable of bearing or begetting children.
Puerperal. Pertaining to childbirth.
Pulmonary. Pertaining to the lungs.
Pulmonic. A medicine for diseases of the lungs.
Pulse. The beating of the heart and arteries.
Pungent. Bitter, acrid.
Purgative. A medicine which causes the bowels to be freely moved.
Purulent. Consisting of or resembling pus.
Pus. The yellowish white fluid produced by suppuration.
Pustules. A pimple on the skin containing pus.
Putrid. Decomposed, rotten.
Pylorus. The orifice of the stomach through which the food passes into the intestine.

Rectum. The lower end of the large intestine.
Recurrent. Returning from time to time.
Refrigerant. A medicine which allays fever or heat.
Regimen. Systematic treatment and diet.
Regurgitate. To throw back.
Remission. A temporary subsidence of disease or pain.
Remittent. Having remissions.
Resolvent. A medicine which has power to disperse inflammation.
Respiration. Breathing.
Restorative. A medicine which restores strength and vigor.
Retina. The internal nervous tissue of the eye.
Revulsive. Repugnant, hostile.
Rheum. A thin, serous fluid secreted by the mucous glands.
Rigor. A convulsive shuddering.
Rubefacient. An external application which produces redness of the skin.

Saccharine. Having the qualities of sugar.
Saliva. The secretion from the glands of the mouth.
Salivation. A continued unnatural flow of saliva.
Salutary. Wholesome, unnatural.
Sanies. A thin, serous fluid exhaled at the surface of ulcers.
Sanguine. Hopeful.
Sanitary. Pertaining to health.
Sanitation. The act of rendering healthy.
Sciatic. Pertaining to the hip.
Scirrhus. A particular kind of cancerous growth.
Sclerotic. The white outer coat of the eye.
Scorbutic. Pertaining to or affected with scurvy.
Scrofulous. Pertaining to or affected by scrofula.
Sebaceous. Giving fatty secretions.
Sedative. A medicine which allays irritation.
Sedentary. Inactive.
Semiflexion. Bending half over.
Senile. Pertaining to old age.
Septic. A substance that promotes the putrefaction of bodies.
Sequelæ. The results of a disease.
Serous. Thin, watery.
Serum. The liquid portion of the blood.
Sewerage. The system of sewers.
Sewage. The refuse matters removed by sewers.

Sialagogue. A medicine which promotes the flow of saliva.
Sinapism. A poultice of powdered mustard seed.
Sinew. That which unites a muscle to a bone.
Slough. The dead part of a sore which separates and falls off.
Solution. A dilution.
Solvent. A medicine which dissolves callous or stony concretions.
Soporific. A medicine which induces sleep.
Sordes. Foul matter, excretions.
Speculum. An instrument for dilating and throwing light into certain passages of the body for the purpose of examining them.
Sphincter. A muscle that contracts the orifice.
Spinal. Pertaining to the spine.
Sporadic. Single, separate, scattered.
Squamous. Scaly, covered with scales.
Stertorous. Snoring.
Stethoscope. An instrument for listening to the sounds of the heart and lungs.
Stimulant. A medicine which quickly increases the vitality.
Stomachic. Pertaining to the stomach.
Stool. Act of expelling excrement.
Strangulation. Suffocation.
Strangury. A painful discharge of urine.
Stricture. The morbid contraction of a passage of the body.
Strumous. Pertaining to scrofula.
Stupor. Mental insensibility.
Styptic. An astringent medicine.
Subcutaneous. Under the skin.
Submaxillary. Under the jaw-bone.
Sudorific. A medicine which causes sweat.
Suppurate. To generate pus.
Suture. A seam, a sewing.
Symptom. A sign, a token.
Syncope. A faint or swoon.
Synchronous. Occurring at the same time.
Syphilitic. Pertaining to or infected with syphilis.
Syphon. A tube or pipe.

Tartar. The concretion which forms on the teeth.
Tepid. Lukewarm.
Tetanic. Pertaining to tetanus.
Therapeutics. That part of medicine which respects the discovery and application of remedies.
Thorax. The bones of the chest.
Tincture. Spirits containing medicinal substances in solution.
Tonic. A medicine increasing the strength of the system.
Tonsils. The glands in the sides of the throat.
Torpid. Dull, stupid, sluggish.
Torpor. Inactivity.
Torsion. The act of turning or twisting.
Trachea. The windpipe.
Tracheotomy. The surgical operation for croup.
Transpiration. Exhalation from the skin.
Transude. To pass through the pores.
Trap. The arrangement in a pipe to prevent escape of foul gas.
Traumatic. A medicine used to cure wounds.
Tremor. An involuntary shivering.
Triturate. To rub or grind to a powder.
Tubercle. A swelling or tumor.
Tumefaction. The act of swelling.
Tympanum. The drum of the ear.
Typhoid. Weak, low.
Typhus. An exhaustive fever.

Ulcer. A sore-secreting pus.
Ulna. The larger bone of the forearm.
Urea. An animal substance of the urine.
Ureter. The excretory duct of the kidney.
Uric Acid. The acid contained in the urine.
Urinary. Pertaining to the urine.
Urine. The secretion from the bladder.
Uterus. The womb.
Uvula. The soft part of the palate.

Vaccine. Derived from cows.
Varicose. Unusually enlarged.
Vascular. Pertaining to or full of vessels, such as veins and arteries.
Venesection. The operation of opening a vein, phlebotomy.
Venous. Pertaining to the veins.
Ventilation. The act of causing fresh air to pass through a place.
Ventral. Belonging to the belly.
Ventricle. A small cavity in a body.
Vermifuge. A medicine to remove worms.
Vertebra. A bone of the spinal column.
Vertigo. Dizziness or swimming of the head.
Vesicant. A blistering application.
Vesication. The process of raising blisters on the skin.
Vesicle. A membranous cavity.
Veterinary. Pertaining to the art of treating the diseases of domestic animals.
Virile. Of or pertaining to a man.
Virus. Contagious or poisonous matter.
Viscera. The contents of the abdomen, as the stomach, intestines, etc.
Viscid. Sticky, glutinous.
Vitiate. To spoil, to contaminate.
Volatile. Capable of wasting away.

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How to Tell Quickly what is the Matter with You. *See* DIAGNOSES DIAGRAMS, p. 1398.

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We give you for one year the privilege of consulting our Chief of Staff of physicians, either personally or through correspondence, and securing medical consultation and prescription *absolutely free.*

Should you at any time during this period require medical advice or full instructions regarding any disease or treatment, address our Chief of Staff, explaining clearly what you want; or, if you desire treatment, be careful to describe fully your symptoms and your ailment, so that you will receive the largest benefit from the treatment that will be given you.

Any prescription that you desire will be sent to you promptly so that you can have it filled by your local druggist without unnecessary delay.

We require in every case that you write clearly your full name and address, and describe your symptoms and state what you want, and also that you enclose stamp for reply, otherwise the correspondence will not receive attention.

UNIVERSITY MEDICAL SOCIETY,

1336-38-40 Cherry Street, Philadelphia, Pa.

SOME WORDS OF PRAISE.

A Few Letters Taken at Random from the Thousands Being Sent to our Medical Staff.

DR. W. W. MYERS, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir:—For some time past different members of my family have suffered from illness. I have to acknowledge that Medicology and your treatment act like magic. You are doing a grand work to offer it to the public.

Yours very truly,
W. G. JONES,
Pastor 18th St. M. E. Church, Philadelphia.

DR. W. W. MYERS, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir:—Some time ago I had an attack of typhoid fever, and convalesced very slowly. I consulted your treatment, and have been completely restored. I am like a new man. Thanking you heartlly, I am

Yours very truly,
JAMES G. SULGER,
No. 608 McKean St., Philadelphia.

DR. W. W. MYERS, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir:—For some years I have been troubled with headaches and bilious attacks. I tried various doctors and various kinds of medicine, and nothing seemed to relieve me until I consulted you. Medicology has certainly done marvelous things for me. I shall advise all my friends afflicted as I was to consult you. Wishing you every success, I remain Yours, more than gratefully,

ALEXANDER HANSON,
No. 2045 S. Hancock St., Philadelphia.

DR. W. W. MYERS, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir:—I have been using Medicology and your treatment, and have received great benefits. Life is again worth living. Wishing you every success, I remain,

Yours very truly,
J. M. JENKS, Mfg. Jeweler,
Lancaster, Penna.

DR. W. W. MYERS, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir:—I take pleasure in writing to you my testimony in favor of your wonderful cough cure in Medicology. I suffered with a terrible cough day and night, and had to sit up at night. Could not sleep at all. I grew worse all the time. I tried several physicians, but did not get any relief. Your treatment has completely cured me, and I now feel as well as I ever did. Thanking you for what you have done for me, I remain, Yours truly,

(MRS.) J. Q. MCATEE,
No. 1714 S. Fifteenth St., Philadelphia.

DR. W. W. MYERS, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir:—For years I suffered with liver disease, etc. I tried every conceivable medicine. My friend Jenks told me about Medicology and your treatments, and I used them as directed, and must say that a perfect cure has been effected. I have not enjoyed as good health for years. Yours very truly,

R. S. LEWIS,
Cumberland, Md.

Dr. W. W. Myers, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir :—I have always been troubled some with catarrh, which I supposed to be the cause of buzzing and deafness. Sometimes I became quite deaf. After taking up your treatment in Medicology and consulting with you, I am pleased to advise you that I have not been so well for twenty years. I am very grateful for what you have done. Yours very truly, J. M. Stevenson, Publisher,
Denver, Colorado.

Dr. W. W. Myers, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir :—I have been taking the treatment in Medicology, under your instructions, and have been greatly relieved and benefited. My health in general is now good.

Yours truly, (Mrs.) J. W. King,
E. Helena, Montana.

Dr. W. W. Myers, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir :—I have had the prescriptions filled out from Medicology, as per your instructions, and I must say that I see the greatest change in my daughter. She has been entirely relieved of her fits, and is improving rapidly, physically and mentally. I will keep on with your treatment. Please send me a good recipe for the asthma.

Yours truly, Mrs. S. H. Mann,
No. 802 Locust street, Lebanon, Pennsylvania.

Dr. W. W. Myers, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir :—I received your letter last week. I have been following the instructions in Medicology, and have been taking the medicine according to your directions. I have entirely recovered, and am feeling quite well. I feel greatly encouraged.

Yours very truly, (Miss) Martha Chritton,
Rocky Ford, Colorado.

Dr. W. W. Myers, Chief of Staff,
University Medical Society, Philadelphia,

Dear Sir :—I have been following the treatment in Medicology as instructed by you, and I think my boy much better, and am very grateful for the service rendered. He does not scream any more during his sleep, and his appetite is improving. I will be glad to have you give me further instructions.

Yours very truly, J. C. Cooley,
Cheyenne, Wyoming.

Dr. W. W. Myers, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir :—The treatment for eczema, as given in Medicology, is improving my condition rapidly. I am very thankful for what you have done for me.

Yours very truly, J. H. Quimby,
Dorchester, Mass.

Dr. W. W. Myers, Chief of Staff,
University Medical Society, Philadelphia.

Dear Sir :—I was advised to write to you by one of my friends who had purchase Medicology. My boy had a very bad case of diphtheria, which had left him in very bad shape, and with all the treatments of physicians he did not seem to get any better. We have had six other cases of diphtheria since I received your book and treatment, and I attended to these cases myself, and they came out all right. The result of your treatment is marvelous.

Yours very truly, E. Daugherty,
No. 523 Van Buren street, Wilmington, Del.